NAO «L.N. GUMILYOV EURASIAN NATIONAL UNIVERSITY»

Module Handbook
Educational program
6B05208 – Ecology and nature management

Nur-Sultan
2022

Module 1

Module code and name	HIST 11001 Modern history of Kazakhstan
Semester(s) when the module is taught	1
Person responsible for the module	Kushenova G.I.
Language of instruction	Russian
Within the curriculum (cycle, component)	General education (mandatory component).
Teaching methods	Problematic learning.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the module	School course of the History of Kazakhstan.
Module objectives / expected learning outcomes	The purpose of mastering the module is to form a system of scientific views on the history of modern Kazakh society in the context of the world historical process. Expected learning outcomes: - to systematize the conceptual foundations of the study of the modern history of Kazakhstan; to compare ideas about the continuity and continuity of historical and cultural development, the deep roots of the spiritual heritage of Kazakhstan; - to reveal the significance of the formation of historical consciousness and worldview attitudes in accordance with national priorities; - classify historical sources reflecting the features of the modern history of Kazakhstan; - to identify historical patterns of development of society, paying attention to the study of historical originality; - to master the techniques of historical description and analysis of the causes and consequences of events in the modern history of Kazakhstan; - to predict possible solutions to modern problems based on the analysis of the historical past and reasoned information; - to argue the features and significance of the modern Kazakh model of development; - - to explain the importance of fostering patriotism in the spirit of democratic values of modern society by the example of the life of historical figures.
Content of the module	Introduction to the course. Kazakhstan on the way to independence: stages of formation of the idea of a national state. Civil-political confrontation. Implementation of the Soviet model of state construction. Contradictions and consequences of Soviet reforms in Kazakhstan in the second half of the twentieth century. Formation of the state structure of the Republic of Kazakhstan. Kazakhstan's model of economic development. Social modernization is the basis of the well–being of society. Ethnodemographic processes and strengthening of interethnic harmony. Prospects of socio-political development and spiritual modernization. The policy of forming a new historical consciousness and worldview of the peoples of the Great Steppe. Kazakhstan is a state recognized by the modern world. N.A. Nazarbayev is a personality in history. Formation of a nation of a single future.
Examination forms	At the end of the semester, the State exam is conducted orally. Examination tickets are used for passing the state exam.
Study and examination requirements	The activity of students in the educational process is mandatory, which is evaluated by the quality of performance. Attendance of classes and participation in the educational process are mandatory. students should not be absent from classes without a valid reason. Tardiness is not allowed. The Code of Conduct and Ethics must comply with the requirements of the university. In this regard, scores from 0 to 100 points are given.
Technical and electronic learning tools	Projector for a presentation.

Reading list	1. Ayagan B.G., Abzhanov H.M., Seliverstov S.V., Bekenova M.S. Modern history of Kazakhstan: Almaty: Rarity, 2010. – 432 p., 2. Kan G.V. History of Kazakhstan: Textbook for universities. – Almaty, 2005. - 232 p., 3. Uly dala tarikhy: textbook / Kan G.V., Tugzhanov E.L. – Astana: Zhasyl Orda, 2015. – 328 p. 4. Momynova S.R. Kazakhstan: ancient, ancient and medieval history. In 2 volumes. - Karaganda, 2018 – 342 p., 5. Kazakhstan tarikhy.5 tamdyk. 1-5-tomdar. – Almaty., 1996, 1997, 2000, 2010. 6. Kazakhstan (Cossack Ate) tarikhs. – 4 kitaptan turatyn okulyk. Tauelsiz Kazakhstan: algyshartary zhane kalyptasuy.4 kitap / T. Omarbekov, B.S. Sailan, A.Sh. Altaev zhane T.b. – Almaty, Kazakh University, 2016. – 264 p. 7. Uly Dala Tarikhy: textbook /Kan G.V., Tugzhanov E.L. – Astana: Zhasyl Orda, 2015. – 328 p. 8. Ayagan B.G., Abzhanov H.M., Mahat D.A. Kozyri Kazakhstan tarikhs. – Almaty, 2010. – 341 p.,

Module 2

Module code and name	ENGL 11103 Foreign language
Semester(s) when the module is taught	1
Person responsible for the module	Ustelimova N.A.
Language of instruction	English
Within the curriculum (cycle, component)	General education (mandatory component)
Teaching methods	Group work. Problematic discussion. Search method. Construction. Essay. Situational modeling. Text analysis. Creative writing.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours - 1 semester., (300 hours per year). Practical: 45 hours -1 semester, (90 hours per year), independent work of students: 105 hours (210 hours per year).
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the module	To master this module, you need the knowledge, skills and abilities acquired during the study of the following courses: Foreign language I (English) minimum-sufficient level (A1, pan-European competence).
Module objectives / expected learning outcomes	The purpose of the module is to form the intercultural and communicative competence of students of non-linguistic specialties in the process of foreign language education at a sufficient level (A2) of the OEC / at the level of basic sufficiency (B1) of the OEC. Expected learning outcomes: - identifies patterns of development of a foreign language, paying attention to the study of stylistic originality; -compares and selects the forms and types of speech/communication corresponding to the communicative intention with a logical construction adequate to the type of speech and adequately expresses its own communicative intentions with the correct selection and appropriate use of the necessary language tools, taking into account their compliance with the socio-cultural norms of the language being studied; - knows the strategy and tactics of constructing a written communicative act, correctly forms speech on the letter, relying on lexical sufficiency within the framework of speech topics and grammatical correctness; - systematizes the conceptual foundations of understanding the partner's communicative intentions at this level; - knows the techniques of linguistic description and analysis of the causes and consequences of events in texts of a scientific and social nature;

Content of the module	Social sphere of communication: Family in modern society. Social and cultural sphere of communication: Entertainment. Social and cultural sphere of communication. Taking care of yourself. Sociocultural sphere of communication: cultural and historical background. Sociocultural sphere of communication: cultural and historical background. Sociocultural sphere of communication: Cultural and historical background/Personal, private life. Sociocultural sphere of communication. Culture. Educational communicative sphere/World. Educational communicative sphere. Student life. Sociocultural sphere of communication: Cultural and historical background. Education. Professional sphere of communication (the name of the topic depends on the specialty). Professional sphere of communication (the name of the topic depends on the specialty). Professional sphere of communication (the name of the topic depends on the specialty). Professional sphere of communication (the name of the topic depends on the specialty). Professional sphere of communication (the name of the topic depends on the specialty).
Examination forms	Combined exam:listening, reading, speaking.
Study and examination requirements	Students are required to attend practical classes in a foreign language and take an active part in the performance of SRS tasks, the results of which are accepted by the teacher online or in the classrooms of the university, depending on the type and form of the task.
Technical and electronic learning tools	Projector for a presentation. Edpuzzle, Kahoot, Socrative, Edmodo.
Reading list	1. Latham-Koenig. English File: Pre-Intermediate Student's Book, 3d ed., Oxford University Press, 2016. 2. Latham-Koenig. English File: Intermediate Student's Book, 3d ed., Oxford University Press, 2016. 3. Latham-Koenig. English File: Pre Intermediate Student's Book, 3d ed., Oxford University Press, 2016. 4. Reading Extra: A resource book of multi-level skills activities / Driscoll Liz. - 9th printing. - Cambridge [etc.]: Cambridge university press, 2017. 5. Speaking extra: a resource book of multi-level skills activities / Gammidge Mick. - 13th print. - Cambridge: Cambridge university press, 2017. 6. Listening Extra: A resource book of multi-level skills activities / Craven Miles. - 10th printing. - Cambridge [etc.]: Cambridge university press, 2016. 7. Writing extra: a resource book of multi-level skills activities / Palmer Graham. - 11th print. - Cambridge: Cambridge university press, 2016.

Module 3

Module code and name	KAZK 11104 Kazakh language
Semester(s) when the module is taught	1/2
Person responsible for the module	Kulmanov K.S.
Language of instruction	Kazakh
Within the curriculum (cycle, component)	General education (mandatory component)
Teaching methods	Group work. Problematic discussion. Search method. Construction. Essay. Situational modeling. Text analysis. Creative writing.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours - 1 semester., (300 hours per year). Practical: 45 hours -1 semester, (90 hours per year), independent work of students: 105 hours (210 hours per year).
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the module	To master this module, the knowledge, skills and abilities acquired by the student in the course "Kazakh language" (A1, A2, B1) are necessary.

Module objectives / expected learning outcomes	To teach students listening (listening), speaking, reading and writing at the B2 level. To participate in communication in various situations of different spheres of communication in order to realize one's own intentions and needs (domestic, educational, social, cultural), stating them ethically correctly, meaningfully fully, lexically-grammatically and pragmatically adequate to the situation at the B2 level; To make the right choice and use of language and speech means to solve certain problems of communication and cognition on the basis of knowledge of a sufficient volume of vocabulary, a system of grammatical knowledge, pragmatic means of expressing intentions at the B2 level.
Content of the module	Introduction to the course. Kazakhstan on the way to independence: stages of formation of the idea of a national state. Civil-political confrontation. Implementation of the Soviet model of state construction. Contradictions and consequences of Soviet reforms in Kazakhstan in the second half of the twentieth century. Formation of the state structure of the Republic of Kazakhstan. Kazakhstan's model of economic development. Social modernization is the basis of the well–being of society. Ethnodemographic processes and strengthening of interethnic harmony. Prospects of socio-political development and spiritual modernization. The policy of forming a new historical consciousness and worldview of the peoples of the Great Steppe. Kazakhstan is a state recognized by the modern world. Formation of a nation of a single future.
Examination forms	Combined exam: listening, reading, speaking.
Study and examination requirements	Interactive whiteboard, projector, electronic textbook, computer, assignments for practical classes, texts on the specialty, additional handout.
Technical and electronic learning tools	Projector for a presentation.
Reading list	1. Asanova U. O., Abduova B. S., Adilbek a.m., Magzumbekova A. K. Kazakh language. Training manual for Level B1). Nur-Sultan: ENU, 2021. - 150 pages. 2. Alimbek G. R. Kazakh language for Russian speakers (textbook for secondary levels B1, B2). Nur-Sultan: "AIIDA baspasy PUBLISHING", 2021.-232 pages. 3. Kulmanov K. S., Adilbek a.m., Magzumbekova A. K., Khamitova A. G. Kazakh language (A1 level. Textbook for international students). Nur-Sultan: L. N. Gumilyov Eurasian National University ENU, 2021. - 176 pages.

Module 4

Module code and name	RUSS 11104 Russian language
Semester(s) when the module is taught	1/2
Person responsible for the module	Nurgazina A.B.
Language of instruction	Russian
Within the curriculum (cycle, component)	General education (mandatory component)
Teaching methods	Group work. Problematic discussion. Search method. Construction. Essay. Situational modeling. Text analysis. Creative writing.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours - 1 semester., (300 hours per year). Practical: 45 hours -1 semester, (90 hours per year), independent work of students: 105 hours (210 hours per year).
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the module	To master this module, the knowledge, skills and abilities acquired by the student in the course "Russian language" (A1, A2, B1) are necessary.

Module objectives / expected learning outcomes	To teach students listening (listening), speaking, reading and writing at the B2 level. To participate in communication in various situations of different spheres of communication in order to realize one's own intentions and needs (domestic, educational, social, cultural), stating them ethically correctly, meaningfully fully, lexically-grammatically and pragmatically adequate to the situation at the B2 level; To make the right choice and use of language and speech means to solve certain problems of communication and cognition on the basis of knowledge of a sufficient volume of vocabulary, a system of grammatical knowledge, pragmatic means of expressing intentions at the B2 level.
Content of the module	Actual problems of modern science. New discoveries of scientists: prospects of use and possible risks. Scientific discoveries and ethics. Achievements in the field of the studied science. Development of science (studied by students). The current state of the studied science. My specialty and globalization. Written business communication. Business correspondence by e-mail. Oral business communication. Terminology of science. The language of the specialty. Written academic text. The culture of professional speech. Types of professional and communicative situations.
Examination forms	Combined exam:listening, reading, speaking.
Study and examination requirements	Interactive whiteboard, projector, electronic textbook, computer, assignments for practical classes, texts on the specialty, additional handout.
Technical and electronic learning tools	A projector for a presentation. Reference and information Internet portal - www.gramma.ru Reference and information Internet portal- www.dic. academic.ru Reference and information Internet portal -www.slovari.yandex.ru
Reading list	1. Russian language: textbook for students of Kazakh departments of universities (Bachelor's degree) / edited by K. K. Akhmedyarov, Sh.K. Zharkynbekova. - 4th edition. - Almaty: "Evero", 2019. - 241 P. 2.Zhuravleva E. A., Asmagambetova B. M., Tashimkhanova D. S., Yavorskaya E. E., Te M. V., Eshekeneva A. K. professional Russian language: a textbook / with general Editing by E. A. Zhuravleva. - Almaty: Evero publishing house, 2021. - 242 P.

Module 5

Module code and name	EDUC 22001 Social and Political Knowledge Module
Semester(s) when the module is taught	1
Person responsible for the module	Burbaeva P.T.
Language of instruction	English
Within the curriculum (cycle, component)	General education (mandatory component)
Teaching methods	Inverted class, problem lecture, case study, brainstorming, game methods
Workload (incl. contact hours, self-study hours)	Total workload: 240 hours. Lectures: 30 hours, practical: 60 hours, independent work of students: 150 hours.
Credit points (total by discipline)	8
Required and recommended prerequisites for joining the module	History of Kazakhstan, Cultural Studies

Module objectives / expected learning outcomes	The purpose of the course: the formation of the socio-humanitarian worldview of students in the context of solving the tasks of modernization of public consciousness, defined by the state program "Looking into the future: modernization of public consciousness". Expected learning outcomes based on the results of the course development: - explain and interpret the subject knowledge (concepts, ideas, theories) of sociology that make up the training courses of the module; - explain the socio-ethical values of society as a product of integration processes in the systems of basic knowledge of the courses of the socio-political module; - algorithmically represent the use of scientific methods and research techniques in the context of specific training courses and in the interaction procedures of the module courses; - explain the nature of situations in various spheres of social communication based on the content of theories and ideas of scientific directions of the courses studied; - provide reasoned and reasoned information about the various stages of development of Kazakhstan's society, social and interpersonal relations; - to analyze the features of the social institution in the context of their role in the modernization of Kazakh society.
Content of the module	The purpose of the course: the formation of the socio-humanitarian worldview of students in the context of solving the tasks of modernization of public consciousness, defined by the state program "Looking into the future: modernization of public consciousness". Expected learning outcomes based on the results of the course development: - explain and interpret the subject knowledge (concepts, ideas, theories) of sociology that make up the training courses of the module; - explain the socio-ethical values of society as a product of integration processes in the systems of basic knowledge of the courses of the socio-political module; - algorithmically represent the use of scientific methods and research techniques in the context of specific training courses and in the interaction procedures of the module courses; - explain the nature of situations in various spheres of social communication based on the content of theories and ideas of scientific directions of the courses studied; - provide reasoned and reasoned information about the various stages of development of Kazakhstan's society, social and interpersonal relations; - to analyze the features of the social institution in the context of their role in the modernization of Kazakh society.
Examination forms	Computer testing.
Study and examination requirements	Students are required to attend lectures and seminars, pre-preparing for lectures and seminars based on textbooks and basic literature, participate in all types of control (current control, boundary control, final control), mandatory participation in intermediate and final certification tests, teacher assignments. The activity of work at the seminar (the ability to conduct a discussion, to argue your position with references to the literature under study, a creative approach to the selection and analysis of texts), the quality of individual written assignments (glossary, etc.) and creative work (essays) highly appreciated.
Technical and electronic learning tools	PowerPoint, MindMeister, Miro.com, XMind, Lucidchart, Canva

Reading list	1. Biekenov K. U., Biekenova S. K., Kenzhakimova G. A. "Sociology: Textbook". – Almaty: Evero, 2016. - 584 P. 2. Abdiraimova G. S. sexual sociology: a textbook. Chapter 2. – Almaty: "Kazakh University", 2012. - 224 p. 3. Brinkerhoff D., Veits R., Ortega S. The basics of Aleumettanu.- Almaty: Ultik audarma Bureau, 2018. – 584 p. 4 and J. Ritzer, J. Stepnitsky's Theory.- Almaty: Ultik Audarma Bureau, 2018. 5) Aitov N. Astana, 2015. 6. Smagambetov B. J. the history of Sheteldik Aleutstvo. – Almaty: Evero, 2016.

Module 6

Course code and name	PhCS 14114 Physical Training
Semester(s) when the course is taught	1/2/3/4
Person responsible for the module	Marchibaeva U.S., Nazarkina O.N.
Language	English
Within the curriculum (cycle, component)	Basic discipline
Teaching methods	Practices
Workload (incl. contact hours, self-study hours)	Total workload: 60 hours- 1,2,3,4 sem. (240 hours per year). Practical: 60 hours -1,2,3,4 sem. (240 hours per year).
Credit points (total by discipline)	8 ECTS
Required and recommended prerequisites for joining the course	To master the course of physical education, knowledge, skills and abilities acquired during the study of the following disciplines are necessary: anatomy, pedagogy, biology.
Course objectives/intended learning outcomes	Formation of competencies in physical culture aimed at developing the student's personality and the ability to use means and methods of physical culture and sports to preserve and strengthen health, psychophysical training and self-preparation for future life and professional activity. Willingness to apply methods, tools, fundamentals of theory and methodology of physical culture and sports to ensure full-fledged social and professional activities. - formation of a healthy lifestyle and lifestyle; -independently select and apply methods and means of physical culture for the formation and improvement of basic physical qualities and motor skills; -correctly perform physical exercises, calculate the dosage of the exercise and make up sets of exercises for the development of basic physical qualities. -preparation for professional activity and service in the Armed Forces of the Republic of Kazakhstan.
Content of the course	The discipline "Physical culture" is the most important component of the holistic development of the individual. Being an integral part of the general culture and professional training of the student during the entire period of study, physical culture is a mandatory section in all components of education, the importance of which is manifested through the harmonization of spiritual and physical forces, the formation of such universal values as health, physical and mental well-being, physical perfection. It ensures the continuity of the educational process with the programs of physical education of students of schools and secondary specialized educational institutions.
Examination forms	Differentiated credit
Study and examination requirements	Students who have not attended all practical classes are not allowed to take differentiated credit. Repetition of the topic and working out of the materials passed for each training session are mandatory. The degree of mastering the educational practical material is checked by testing the physical fitness of students. Testing of students can be carried out without warning.
Technical and electronic learning tools	Sports equipment, sports equipment,TV and video equipment

Reading list	1. Moiseeva N.A. Gymnastics with teaching methods : textbook / N.A. Moiseeva. - Almaty : New book, 2020. - 152, [1] p. : ill., tab. - Bibliogr.: p. 147. 2. Borodikhin V.A.Health-saving orientation of physical education and sports of schoolchildren and students: [monograph] / V.A. Borodikhin, Zh.A. Usin, Zh.A. Usina. - Almaty : SSK, 2019. – 302 p. 3. Theory and methodology of teaching basic sports. Athletics : textbook for educational institutions of higher professional education, in the direction of training "Physical culture"/G.V. Gretsov, S.E. Voynova, A.A. Germanova, etc.; edited by G.V. Gretsov and A.B. Yankovsky. - 3rd ed., ispr. - Moscow: Academy, 2016. – 287 p. 4. Marchibaeva U.S. Methodological foundations of physical culture: electronic textbook/Mubarakkyzy B.M., Taskeev D.S., Kulanova K.K., Sidorova R.V. Astana: L.N.Gumilyov ENU, 2015.Certificate of state registration of rights to the copyright object. IS 002796

Module 7

Course code and name	ECOL 12001 Introduction to the specialty
Semester(s) when the course is taught	1
Person responsible for the module	Abzhalelov A.B., Doctor of Biological Sciences, professor
Language	English
Within the curriculum (cycle, component)	Basic discipline (University component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work Case study, brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method, lecture-conference, “hot chair” method, model method (real situation modelling).
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Existing competences in chemistry, ecology, ecology of the soil, water, air, geology. List of related subjects: chemistry, physics of environment, ecology of the person, social ecology, plant ecology
Course objectives/intended learning outcomes	Objectives: The course "Introduction to the Specialty" examines the natural science foundations of environmental education. Mastering the basics of ecology develops the ability to further independent understanding of the complex and diverse material of modern necology. Knowledge about the formation of the population and ecosystem, the patterns of the third distribution contribute to a deeper disclosure of complex dialectical connections in the biosphere. Considering the ecosystem as a structural unit of the biosphere, resulting from the interaction of natural and anthropogenic factors, students get a more complete picture of the universal connection and interaction in nature and society. To know is the assimilation of the essence of scientific and technical progress; to acquaint with the positive and negative aspects of technical progress; Have the opportunity to become familiar with the characteristics of the main industrial sectors and their interaction with each other; admit the ways and directions of the impact of various industrial enterprises on the main components of the biosphere and their consequences; Have skills - to master the ways of greening technological processes of various industrial enterprises; master the ways and methods of environmental monitoring; learn the understanding between natural cooperation in the field of environmental protection.

Content of the course	The intensification of human economic and production activities in modern conditions of nature management and the global scale of anthropogenic impact on the main components of the biosphere create a situation of acute ecological crisis caused by the degradation of environmental objects. In this regard, the role of environmental impact management is important to optimize the conditions for human interaction with nature.
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the 15th week before the exam) to test students' knowledge. Time for intermediate control is 50 minutes. The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	The exam in the discipline "Introduction to the specialty" is taken orally. You need to know that only the oral examination method allows you to fully assess the knowledge of students (for example, ask additional diverse questions).
Technical and electronic learning tools	Interactive whiteboard, projector, computer https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/
Reading list	1. Koshkarov N. B., Abseitov E. T., Massenov K. B. Textbook «Basics of ecological rationing and expertise». Almaty, - 2018. 2. Kuznetsova T. A.; Biology. 2nd ed., Database: Lan Publishing. 2018. 3. Scientific foundationsofecobiotechnology: a textbook / Alexander E. Kuznetsov, Nina B. Gradova. - Moscow: Mir, 2016. 4. Protection of terrestrial and aquatic ecosystems: a textbook / R. A. Alybaeva; Ministry of Education and Science of the Republic of Kazakhstan. - Almaty: Bastau, 2013. 5. Bigaliev A. B., Khalilov M.F., Sharipova M.A. Basics of General Ecology, - Almaty, “Kazakh University”, 2007.

Module 8

Module code and name	CSSE 11005 Information and communication technologies
Semester(s) when the module is taught	2
Person responsible for the module	Karymsakova A.E.
Language of instruction	English
Within the curriculum (cycle, component)	General education (mandatory component)
Teaching methods	Interactive, project method, case study, student-centered learning
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the module	Computer science

Module objectives / expected learning outcomes	The purpose of using ICT multimedia in the educational process is determined by the possibility of implementing intensive forms and methods of teaching, strengthening the motivational component of learning through the use of modern means of processing audiovisual information, increasing the level of emotionality of its perception, forming skills to implement various forms of independent information processing activities. Knowledge: - explain the purpose, content and trends in the development of information and communication technologies, justify the choice of the most appropriate technology for solving specific tasks; know the specifics of using multimedia on the Internet; - explain the ways of collecting, storing and processing information, ways of implementing information and communication processes; develop multimedia content; - describe the architecture of computer systems and networks, the purpose and functions of the main components; - use Internet information resources, cloud and mobile services to search, store, process and distribute information; - use software and hardware of computer systems and networks for data collection, transmission, processing and storage; - analyze and justify the choice of methods and means of information protection; - using digital technologies to develop data analysis and management tools for various types of activities; - to carry out project activities in the specialty using modern information and communication technologies. Competencies: - mastering the conceptual foundations of the architecture of computer systems, operating systems and networks by students; evaluate the effectiveness of digitalization in professional fields; - formation of knowledge about the concepts of development of network and web applications, information security tools; - formation of skills in the use of modern information and communication technologies in various fields of professional activity, scientific and practical activities, for self-education and other purposes.
Content of the module	The role of ICT in key sectors of society development. ICT standards. Introduction to computer systems. Architecture of computer systems. Software. Operating systems. Human-computer interaction. Database systems. Data analysis. Data management. Networks and telecommunications. Cybersecurity. Internet technologies. Cloud and mobile technologies. Multimedia technologies. Smart technologies. Electronic technologies. Electronic business. E-learning. Electronic government. Information technologies in the professional sphere. Industrial ICT. Prospects for the development of ICT.
Examination forms	Computer testing
Study and examination requirements	Mandatory attendance of online and classroom classes, active participation in the discussion of issues, preliminary preparation for lectures and practical classes, high-quality and timely performance of SRO tasks, participation in all types of control.
Reading list	1. Brown G., Sargent B., and Watson D. Cambridge IGCSE ICT. - London: Hodder Education Group, 2015. -439 p. 2. Williams B. K. and Sawyer S. Using information technology: A practical introduction to computers & communications. - New York: McGraw-Hil., - 8th ed. -2010. -563 p. 3. Watson D. and Williams H. Cambridge IGCSE Computer Science: Hodder Edu.; 3 ed. 2015.-278 p. 4. Evans V. Information technology. Books 1-3: English for specific purposes.- 5th impr.- Newbury: Express Publishing, 2014.- 40 p.

Module 9

Course code and name	ECOL 12002 Biodiversity of biocenoses
Semester(s) when the course is taught	2
Person responsible for the module	Zhantokov B.Zh. senior lecturer of the department
Language	English
Within the curriculum (cycle, component)	
Teaching methods	Lecture: Multimedia lecture. A video lecture developed by the author of the discipline. Questions and answers. Showing short videos on the topic of the lecture. Seminar assignments (practice): group work, communicative method, 6 hat method, cinquain method, interactive method, differentiated approach, project method.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, it is necessary to know the environmental aspects of natural science, bioecology, Introduction to the specialty
Course objectives/intended learning outcomes	Objectives of the discipline: to familiarize students with methods of control over the export of biological resources, taking into account possible damage to biodiversity not only within the country, but also in neighboring States parties to the Convention, as well as in the conservation and sustainable use of components of biological diversity of the Republic of Kazakhstan and obtaining economic benefits, development and improvement of environmental management strategy, regulatory and legal the base and system of financial support for biodiversity conservation programs. The knowledge, skills and abilities acquired during the study of the discipline are necessary for the formation of ecological thinking, outlook, the ability of a person to navigate issues of rational nature management, as well as for further study of disciplines: fundamentals of systemic ecology, environmental protection, microbiology, taxonomy.
Content of the course	"Biodiversity of Biocenoses" is a synthetic module that studies the diversity of all existing and extinct plant species and ways to bring this diversity into a logically ordered system.
Examination forms	The exam on the subject of Biodiversity of biocenoses is taken orally. Because: First of all, in order to fully test the knowledge of students, to deeply determine their conversational skills, the ability to express their thoughts is determined only by the oral method. Secondly, the third question of the examination ticket for this discipline can be evaluated in the form of calculations, and it can be evaluated only by asking orally. Thirdly, I believe that only the oral exam method allows you to fully assess the knowledge of students (for example, ask additional questions).
Study and examination requirements	During the academic semester, two intermediate tests are conducted (the first after the seventh week of study and the second after the fifteenth week before the exam) to check the students' knowledge orally. The time of intermediate control is 50 minutes. The exam is conducted orally. There are three questions in each exam ticket and the student is given 30 minutes to prepare
Technical and electronic learning tools	Projector, computer https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/ Google (Google Glass/ Google Forms)
Reading list	Muslim S.B. Flora of Kazakhstan, Almaty 2009. Protection of terrestrial and aquatic ecosystems: textbook / R. A. Alymbaeva; Ministry of Education and Science of the Republic of Kazakhstan. - Almaty: Bastau, 2013. Workshop on microbiology: a textbook for students of higher educational

	institutions / A. I. Netrusov, M. A. Egorova, L. M. Zakharchuk, etc.; edited by A. I. Netrusov. - M.: Academy, 2005

Module 10

Course code and name	ECOL 13001 Biological components of the environment
Semester(s) when the course is taught	2
Person responsible for the module	Adilbektegi G. – candidate of geographical sciences, assistant professor of the department TussupovaZh.B. – candidate of biological sciences, assistant professor of the department
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Lecture: Multimedia lecture. Questions and answers. Show of short videos on the topic of the lecture. Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Introductiontothespecialty
Courseobjectives/intendedlearningoutcomes	Knowledge: students know that are given basic knowledge about the classification of living organisms, life forms, understanding the patterns of their distribution in the environment; are taught to assess their biocenotic role. Theoretical knowledge of basic concepts in the field of biology is fixed on practical exercises and forms the natural science outlook. Skills: students know how to apply knowledge in the field of biology for development of general professional disciplines and solving professional issues. Competences: students are able to do activities for the study, assessment of the state and protection of biota as a component of ecosystems and the biosphere, for the implementation of measures for environmental monitoring and protection of the environment, assessment, and protection of biodiversity.
Content of the course	The discipline studies the biology of living organisms, which reveals the laws of life and its development as a special phenomenon of nature. Among other sciences, biology is a fundamental discipline and belongs to the leading branches of natural science.
Examination forms	The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	Taking an oral exam has certain advantages, as it allows you to prepare an answer in the most complete, reasonable and detailed form with examples and explanations. Forms a creative approach of students to the subject, contributes to the development of skills in analyzing and generalizing the material being studied, which, in turn, leads to a deep understanding and the formation of a complex, holistic and interrelated understanding of the subject. the discipline is being studied.
Technical and electronic learning tools	Multimedia projector, computer, interactive whiteboard https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/
Reading list	1.General Biology: Textbook /Ed. Konstantinova V. M. - M.: Academia, 2018. - 704 p. 2.Konstantinov, V. M. General biology: Textbook / V. M. Konstantinov. - M.: Akademiya, 2019. - 304 p.

	3.Tupikin, E. I. General biologywiththebasicsofecologyand environmental protection: A textbook /E. I. Tupikin. - M.: Academia, 2017. - 516 p. 4.Netrusov, A. I. Biology. University course: Textbookforstudentsofinstitutionsofhigher professional education / A. I. Netrusov, I. B. Kotova. - M.: IC Academy, 2017. - 384 p. 5.Azova, M. M. Human geneticswiththebasicsofmedicalgenetics (forspo) /M. M. Azova. - M.: KnoRus, 2018. - 539 p.

Module 11

Course code and name	HIM 13002 Chemistry
Semester(s) when the course is taught	2
Person responsible for the module	F.O. Suyundikova, Ph.D., Associate Professor
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Lecture: Multimedia lecture. Questions and answers. Show of short videos on the topic of the lecture. Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work. SIW tasks: each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Existing competences in chemistry and knowledge of basic information of physics
Course objectives/intended learning outcomes	To form the ability to use knowledge about the structure of matter, the nature of the chemical bond, the properties of chemical elements, simple and complex compounds and materials based on them to solve problems of professional activity
Content of the course	Teaching students to apply knowledge and demonstrate practical skills in setting up a chemical experiment in the field of ecology and environmental protection; know the features of the structure of atoms of metals and non-metals based on their position in the PSCE; find the dependence of the physical and chemical properties of metals and non-metals on the type of chemical bond and structural features; understand technogenic flows of substances in biogeocenosis; ecological properties of chemical elements and their compounds; know the migration of chemical pollutants in natural waters, soil solution, atmosphere and their entry into the human body, acquire skills and abilities to use methods to solve environmental problems.
Examination forms	During the academic semester, two intermediate examinations are conducted (the first after the seventh week of study and the second after the 15th week before the exam) to test students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	Taking an oral exam has certain advantages, as it allows you to prepare an answer in the most complete, reasoned and detailed form with examples and explanations. Forms a creative approach of students to the subject, promotes the development of skills of analysis and generalization of the studied material, which, in turn, leads to a deep understanding and formation of a comprehensive, holistic and interrelated understanding of the subject. The examination ticket for this discipline can be evaluated in the form of calculations, and students should can perform some chemical reactions.
Technical and electronic learning tools	Interactive whiteboard, projector, computer
Reading list	1. Akhmetov N.S. General and inorganic chemistry. –M: Lan,- 2018. – 744 p. 2. Glinka N.L. General chemistry. M.: KnoRus, - 2020. - 750 p. 3. Astafyeva L.S. Ecological chemistry. – M.: Asadema.-2006.- 223 p. 4. Blinov L.N. Fundamentals of ecological chemistry. St. Petersburg: - 2001. -

	75 p. 5. Huey J. Inorganic chemistry. – M.: Chemistry, - 2016. – 545 p. 6. Kukushkin Yu.N. Chemistry of coordination compounds. – M.: Higher School. -2015. -455 p. 7. Nikolsky A.B., Suvorov A.V. General and inorganic chemistry. – Yurayt, - 2021. – 378 p.

Module 12

Module designation	EDIN 22015 Educational practice
Semester(s) in which the module is taught	2
Person responsible for the module	Kobetaeva N.K -PhD, associate professor
Language	English
Relation to curriculum	Basic discipline (University component)
Teaching methods	Educational practice is aimed at expanding and consolidation of theoretical and practical knowledge acquired by students during their studies, acquisition and improvement of practical skills in the chosen educational program, preparation for future professional activities. Being the central link in the system of specialists' training, educational practice helps students to understand better the correctness of their professional choice, to check the assimilation of theoretical knowledge received during the training and to determine professionally important qualities of the future specialty. Using the unique capabilities of the organization allows to adapt the knowledge and skills of students to the conditions of specific industries already in the process of training.
Workload (incl. contact hours, self-study hours)	Practice-90
Credit points	3 (ECTS)
Required and recommended prerequisites for joining the module	The basics of biology, geography, chemistry, mathematics, physics, as well as disciplines bioecology, introduction to the specialty
Module objectives/intended learning outcomes	The purpose of the training practice of the 1st course is to familiarize, study field methods of environmental monitoring Karkaraly SNPP, as well as work on bio- and geoindication of different environments. Objectives of the training practice: 1.Study of biodiversity of Karkarala SNNPP. 2.General complex estimation of ecosystems 3. Bioindication and geoindication 4. Nature conservation activities, study of protected areas.
Content	1) Ecology and Sustainable Development. 2) Conservation. 3) Biodiversity of fauna and flora. 4) Collection and primary processing of material. 5) Bioindication methods of research.
Exams and assessment formats	The exam is taken orally, that is, in the form of report defence. The form of intermediate control of a student-trainee based on the results of all types of professional practice is a differentiated test (defense of the report at a meeting of the commission of the issuing department). When defending the results of the internship, the student-trainee reports on its results, answers the questions posed, provides a package of documents based on the results of the professional internship and expresses his own conclusions and proposals to the commission.
Study and examination requirements and forms of examination	According to the results of the professional training practice the student provides reporting documentation to the department: practice diary-report (report at the discretion of the department). At the end of practice the student must demonstrate the acquired skills and experience. - filled-in internship report; - filled-in internship diary;

	- characteristic given by the head of practice; - completed individual assignment from the department (if any) Besides, the instructor develops criteria of knowledge, abilities and skills estimation. These criteria take into account specifics of the discipline. Assessment criteria are available to all students in the curriculum of the disciplines.
Reading list	1. Gorshkov M.V. Environmental monitoring. Moscow 2010, 425 pages 2.Ashikhmina, T.Ya. Environmental monitoring. T.Ya. Ashikhmina.-M.: Academic project, 2019 .-- 416 p. 3. Vartanov, A.Z. Methods and devices for environmental control and environmental monitoring / A.Z. Vartanov, A.D. Ruban, V.L. Skinner. - Vologda: Infra-Engineering, 2016 .-- 640 p. 4. Kropotov Yu. A., Proskuryakov A. Yu., Belov A. A. Algorithms of automated systems for environmental monitoring of industrial production: monograph 5. Bigaliev A.B., Khalilov M.F., Sharipova M.A. Fundamentals of General Ecology of Almaty, "Kazakh University", 2007. 6. Conservation of biodiversity in Central Asia. Kazakhstan, Edited by T.M. Bragina, O.B. Pereladova. Almaty, 1997. 7. Chigarkin A.V. Geoecology and nature protection of Kazakhstan - Almaty: Kazakh university, 2003, - 338p. 8..S.A. Pavlovich, Somodelnye collections in botany, Moscow, 1961 9. M. Kozlov, E. Ninburg, Your collection, Collection and production of zoological collections, M., "Education", 1971 10. Emelyanov, A. G. Fundamentals of nature management: textbook / A. G. Emelyanov. - 2nd ed., Erased. - Moscow: Academy, 2006 .-- 304 p. 11. Fokin, Yu. G. Theory and technology of teaching: an activity approach: a textbook for universities / Yu. G. Fokin. - Moscow: Academy, 2006. 12. Environmental expertise: textbook / V. K. Donchenko; ed. V. M. Pitulko. - 2nd ed. ; erased. - Moscow: Academy, 2005 .-- 480 p.

Module 13

Module code and name	PHIL 21002 Philosophy
Semester(s) when the module is taught	3
Person responsible for the module	Tolgambayeva D.T.
Language of instruction	English
Within the curriculum (cycle, component)	General education (mandatory component)
Teaching methods	Inverted class, problem lecture, case study, brainstorming, game methods
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the module	History of Kazakhstan, Cultural Studies

Module objectives / expected learning outcomes	The purpose of the course is to form students' holistic systemic understanding of philosophy as a special form of cognition of the world, its main sections, problems and methods of their study in the context of future professional activity. - To know the meaning of the main philosophical concepts and categories, the content of the main philosophical concepts regarding fundamental philosophical problems, the laws of the development of nature, society and thinking; - Be able to apply the conceptual and categorical apparatus, the basic laws of the humanities and social sciences in professional activity; apply methods and means of cognition for intellectual development, raising the cultural level, professional competence; analyze processes and phenomena occurring in society; interpret philosophical texts (primary sources and commenting literature), as well as present their interpretation in writing, and in oral form; - - Have the skills of philosophical thinking to develop a systematic, holistic view of the problems of society; competently express and argue their point of view (orally and in writing) when borrowing and interpreting certain of the learned ideas and concepts, the ability to trace the relationship between different traditions and trends.
Content of the module	The emergence of a culture of thinking. The subject and method of philosophy. Fundamentals of philosophical understanding of the world. Consciousness, soul and language. Genesis. Ontology and metaphysics. Cognition and creativity. Education, science, technology and technology. people and the Universe. The world of things. Life and death. The meaning of life. Ethics. The philosophy of values. Axiology and morality. The philosophy of freedom. The concept of freedom in the history of philosophy. Philosophy of art. Society and culture. Philosophy of history. Philosophy of religion. "Mangilik el" and "Rukhani zhangyru" – the philosophy of new Kazakhstan.
Examination forms	Computer testing
Study and examination requirements	Attendance of classes and active participation in the educational process are mandatory. High-quality and timely performance of SRO tasks, actively participate in the oral survey conducted by the teacher during classes, written express control. The preparation by the student of messages (reports) on certain issues of the topic under study, participation in a free discussion organized by the teacher in order to consolidate and deepen the knowledge gained at lectures and in the process of independent work also contributes to a significant increase in the level of knowledge. For the qualitative development of the course, the student should focus on the fact that he works independently with texts, approximately 40-60 pages per week. To successfully pass the final control, the student will have to pass test tasks in Platonus in the amount of 40 questions.
Technical and electronic learning tools	Computer, projector, and applications: mook.enu.kz , moodle.enu.kz
Reading list	1. Abdildin Zh.M., Abdildina R.Zh.. History of philosophy. – Almaty, Asem-System, - 2010. – 258 p. 2. Hess R. Philosophiyanyn tandauly 25 kitabs. /Gylym ed . Raev D.S. – Astana, 2018. -360 b. 3. Yesim, G. Metaphysics of man. - Almaty, 2012 4. Mironov V.V. Philosophy. Textbook. – M.: Prospect, 2016. – 289 p. 5. Masalimova A.R., Altaev Zh.A., Kasabek A.K. Kazakh philosophy. Study guide. – Almaty, 2018 6. Johnston D. A brief history of philosophy/ per. E.E. Sukharev. – M.: Astrel, 2010. – 236 p. 7. Yesim, Mr. Hakim Abai.- Astana, 2012 Yesim, G. The wisdom of Shakarim.- Almaty, 2008

Module 14

Course code and name	ECOL 23001 Animals and plants ecology
Semester(s) when the course is taught	3
Person responsible for the module	Adilbektegi G. - Candidate of Geographical Sciences, Acting Associate Professor of the Department
Language	English

Within the curriculum (cycle, component)	Basic discipline (University component)
Teaching methods	Case method, brainstorming, group work, communicative method, method of 6 hats. Lecture: Traditional, problematic, multimedia. Assignments for practical work are developed for each topic. Performing tasks individually and in subgroups. Each subgroup works individually and draws up projects on the topic of practical work. Tasks for SRO: Each subgroup prepares scientific articles and news on the topic. Make presentations on each SRO topic
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Biodiversity of plants, animals and microorganisms.
Course objectives/intended learning outcomes	The purpose of mastering the discipline "Ecology of animals and plants" is to understand the mechanisms of the impact of environmental factors on living organisms, to study the patterns of vital activity of organisms in their natural habitat, taking into account the changes introduced into the environment by human activity.
Content of the course	To study the seasonal features of ethology and the relationship of living organisms adapting to the conditions of existence. Students should understand the biological cycles of the species that ensure the survival of individuals and determine the nature of the dynamics of the population of the species; adaptation of animals and plants to environmental conditions; ecological relationships of animals and plants; Ecological groups of living organisms in relation to various environmental factors. The content of the discipline consists of topics; 1. The influence of environmental factors on animals and plants. 2. Habitat of organisms 3. Ecology of the population 4. Community ecology 5. Study of plant life forms and plant development strategies. 6. Plant resistance and their reaction to the adverse effects of factors.
Examination forms	During the academic semester, two intermediate examinations are conducted (the first after the seventh week of study and the second after the 15th week before the exam) to test students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	Taking an oral exam has certain advantages, as it allows you to prepare an answer in the most complete, reasoned and detailed form with examples and explanations. Forms a creative approach of students to the subject, promotes the development of skills of analysis and generalization of the studied material, which, in turn, leads to a deep understanding and formation of a comprehensive, holistic and interrelated understanding of the subject.
Technical and electronic learning tools	Projector, computer, interactive whiteboard https://www.microsoft.com/ https://www.socrative.com/ Google (Google Glass/ Google Forms)
Reading list	1. Eremchenko, O. Z. Biology: the doctrine of the biosphere: textbook. manual for SPO / O. Z. Eremchenko. — 3rd ed., reprint. and additional - M.: Yurayt Publishing House, 2018. — 236 p . 2. Pavlova, E. I. General Ecology: textbook and workshop for applied bachelor's degree / E. I. Pavlova, V. K. Novikov. — M.: Yurayt Publishing House, 2019. — 190 p. 3. Taylor D. Biology: in 3 volumes. — M.: Laboratory of Knowledge, 2021. — From 2021. 4. Tretyakova, N. A. Fundamentals of ecology: textbook. handbook for universities. - M.: Yurayt Publishing House, 2019. — 111 p.

Module 15

Course code and name	ECOL 23002 Biogeochemical monitoring

Semester(s) when the course is taught	3
Person responsible for the module	Saspugaeva G.E.-Associate Professor, Orkeyeva A.N.-Senior Lecturer
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Lecture: Multimedia lecture. Questions and answers. Showing short videos on the topic of the lecture Workshop tasks (practice): Divides the group into several subgroups. Each subgroup is prepared individually. 6 hats method, cinquain method, interactive method, differentiated approach
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Chemistry, Bioecology, Introduction to the specialty
Course objectives/intended learning outcomes	Purpose: Formation of knowledge about the main provisions of biogeochemistry and skills of biogeochemical monitoring. Gives students an idea of the biogeochemical structure of the biosphere, the main routes of migration of chemical elements and the role of living organisms in this process. Know the main patterns of the geographical distribution of chemical elements in the biosphere and the features of biochemical processes and the biogeochemical cycle of elements in organisms. Be able to - determine the biogeochemical assessment of the state of the environment and biota. Have skills - evaluates the influence of living organisms on the evolution of the chemical components of the biosphere and their relationship.
Content of the course	A discipline based on biology and geochemistry that studies the chemical composition of living organisms, their participation in geochemical processes occurring in the Earth's biosphere.
Examination forms	The exam is conducted orally. Each exam ticket consists of three questions, the student is given 30 minutes to prepare.
Study and examination requirements	Midterm control 1 The student must pass 5 abstracts, write a control, participate in seminars, defend 1 presentation. Midterm control 2 The student must pass 4 essays, write a test, take part in seminars, defend 1 presentation. Outcome: The student is obliged to provide lecture notes, notes of self-study, pass an oral survey on the topics studied.
Technical and electronic learning tools	ERA program GIS methods Microsoft teams learning platform https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/
Reading list	1. V.N. Bashkin Biogeochemistry. M.: Higher school, 2008.- 423p. 2. Bezuglova O.S., Orlov D.S. Biogeochemistry. Textbook for students of higher educational institutions. Series "Textbooks, teaching aids". - Rostov-on-Don: "Phoenix", 2000. - 320 p. 3. Latyshenko, K.P. Environmental Monitoring: Textbook and Workshop for Applied Baccalaureate / K.P. Latyshenko. - Lyubertsy: Yurayt, 2016. - 375 p. 4. Sharova, N.I. Ecological monitoring of the technosphere: Textbook / N.I. Sharov. - St. Petersburg: Lan, 2014. - 368 p.

Module 16

Course code and name	ECOL 23003 Bioecology
Semester(s) when the course is taught	3
Person responsible for the module	Saspugaeva G.Yu. - Candidate of Sciences, Associate Professor, Kobetaeva N.K.

	- Candidate of Sciences, associate professor, Sarkeeva A.N. - senior lecturer
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Lecture: Multimedia lecture. A video lecture developed by the author of the discipline. Questions and answers Showing short videos on the topic of the lecture Tasks of the seminar (practice): group work, communicative method, 6-hat method, cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (simulation of a real situation). Presentation for each lesson using a computer, projector, interactive whiteboard
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Biological components of the environment, Introduction to ecology
Course objectives/intended learning outcomes	To provide students with basic knowledge about the basic principles of bioecology and to develop skills in conducting bioecological monitoring. The course includes questions of stages, models of ecology of organisms and the environment, adaptive mechanisms of living organisms, natural associations, ecosystems, problems of rational use of natural resources and problems of modern ecology. To be able to use the acquired knowledge and methods on the basis of industrial practice of environmental monitoring.
Content of the course	Knowledge about the peculiarities of the vital activity of living organisms, laws and phenomena in nature and the relationship of organisms with the environment. As well as training in the influence of various factors on the vital activity of living organisms and measures to protect them.
Examination forms	The exam is given orally, that is, in the form of an examination ticket. Exam tickets consist of 25 options. Each ticket consists of 3 questions. Exam questions cover all the material passed during 1 semester of full training in a lecture and practical lesson. Taking oral exams of students in the form of examination tickets, we can fully test their knowledge: knowledge about the main functional ecological units: individual species, populations, biogeocenoses, ecosystems; to master the problems of natural resources and their effective use - to form theoretical knowledge about the biosphere - the global ecosystem; ideally, to assess how much they have mastered the emphasis on knowledge about modern environmental problems and their development. Course Policies and Procedures - be at lectures/seminars on time; -attendance of classes; -active participation in the discussion of issues; -preliminary preparation for lectures and seminars on basic literature; -high-quality and timely implementation of the CMP; participation in all types of assessment (current assessment, SRO, intermediate assessment, final assessment Oral examination Oral exam with a choice of tickets. Because at the oral exam, students can show their knowledge by speaking, discussing and analyzing questions. On the test exam, they cannot show this ability
Study and examination requirements	An examination session is usually referred to as the period of time during an academic semester when students take exams. Teachers should prepare examination materials and distribute them 1 month in advance, as well as inform students about the form of the examination session before the start of each session. The forms of the exam can be oral, written, combined, computer testing or matrix testing. Exam tickets consist of 3 questions. Depending on the number of students in the group, examination tickets are issued. If the exam will take place in the form of a test, there should be several test options. Each option should have at least 20-25 questions. Students' knowledge, skills and abilities are evaluated depending on the answer to the exam. The system for evaluating student learning outcomes is presented in the syllabus.
Technical and electronic learning tools	Interactive whiteboard, projector, computer

Reading list	1. Bigaliev, A. B. Bioecology.- Almaty, 2016 2.Kolesnikov S. I. Biology with the basics of ecology.- Rostov n/A: Phoenix, 2016. - 224s. 3. Kolomaeva S. Zh.. Ecology and sustainable development.- Almaty, 2018 4. Prostakov N.I., Golub V.B. Bioecology. Textbook: - VSU Publishing House, 2015. 5.Lyubimov V.B.; Borzdyko E.V.; Melnikov I.V.; Avramenko M.V. Bioecology (workshop) Russia, Europe: Limited Liability Company "Publishing House "Academy of Natural Sciences", 2015. 6. Tikhonov A.I. Ecological problems: A course of lectures. - Ivanovo, 2072 7. Sakharova A.D. Bioecology, textbook, - International State Ecological Institute named after BSU. Belarus, Europe: UMO for Natural Science Education, 2013.Alisheva K.A. Ecology, 2016 8. Kenesariev U.I. Ecology and public health, 2017 https://www.microsoft.com/

Module 17

Course code and name	ECOL 23004 Ecological toxicology
Semester(s) when the course is taught	3
Person responsible for the module	Kapsalyamov B. Doctor of Technical Sciences, Professor of the Department
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Case study, brainstorming, group work, communicative method, interactive method, differentiated approach, project method, lecture-conference, hot chair method, model method (simulation of a real situation). Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Showing short videos on the topic of the lecture Workshop tasks (practice): Divide the group into several subgroups. Each subgroup prepares individually and each subgroup makes its own calculation on the topic of practical work Tasks of the CDS: Each subgroup prepares scientific news on the topic; videos will be organized on the topic of practical work, presentations and debates on the topic
Workload (incl. contact hours, self-study hours)	lecture -30, seminar -30, self-study -120, total - 180
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	ecological aspects of natural science, bioecology, introduction to the specialty
Course objectives/intended learning outcomes	The purpose of this course is the formation of theoretical ecological toxicology, studies chemical and chemical-biological processes in the environment, gives a general idea of the state of the environment, the impact of human activities on it, and the problems of rational use of natural resources. After studying the discipline, the student must: - know the basic patterns of chemical and chemical-biological processes occurring in the biosphere; - be able to analyze possible transformations of emissions and discharges from industrial enterprises and transport into air, water and soil and their impact on living organisms; - have the skills of analytical determination of toxicants in natural objects.
Content of the course	Ecological xenobiotics, understanding the damage from their impact on ecosystems, assessing the dynamics of ecosystem degradation, organizing ecotoxicological expertise. The course includes issues of distribution, migration, transformation of toxic substances, their impact on ecosystems and circulation in the biosphere, especially in food chains. Tools for achieving the goal: independent work of students with a teacher, practical work in laboratory classes, work experience.
Examination forms	The exam is conducted orally. Each exam ticket consists of three questions, the student is given 30 minutes to prepare.

Study and examination requirements	Midterm control 1 The student must pass 5 abstracts, write a control, participate in seminars, defend 1 presentation. Midterm control 2 The student must pass 4 essays, write a test, take part in seminars, defend 1 presentation. Outcome: The student is obliged to provide lecture notes, notes of self-study, pass an oral survey on the topics studied.
Technical and electronic learning tools	Microsoft teams learning platform https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/ Google (Google Class/Google Forms)
Reading list	1 Bozhbanov A.Zh., Medeuova G.Zh. Ecotoxicology. :- Educational process.- Karaganda.- 2014.- 276 p. 2 Golodovskaya L.F. Chemistry of the environment. Moscow, 2008 3 Chemistry of the environment: the educational process / Myrzalieva S.K., Abdibattaeva M.M., Berdikulova F.A., Aimbetova E.O. - Almaty: Kazakh University, 2014. - 284 p.

Module 18

Course code and name	EMB 2205 Ecological metrology and Biometry
Semester(s) when the course is taught	3
Person responsible for the module	Akbayeva Lyailya, Candidate of Biological Sciences, Professor of the Department
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Informational or problem lecture with the calculation of tasks Tasks of the seminar (practice): The division of the group into several subgroups. Each subgroup is prepared individually Tasks of the SRS: Statistical processing and presentation of an array of data. Communicative method, 6-hat method, cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (modeling of a real situation).
Workload (incl. contact hours, self-study hours)	Total workload: 180 hours. Lectures: 30 hours, practical: 30 hours, independent work of students: 150 hours.
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, it is necessary to know the basics of biology, geography, chemistry, physics, as well as related disciplines Biology, biodiversity of biocenoses, Introduction to the specialty, bioecology.
Course objectives/intended learning outcomes	Objective: to acquaint environmental students with the basic methods of measuring and analyzing experimental material and assessing their reliability using various mathematical and statistical formulas and methods, as well as to teach students how to use these formulas and methods. Course objectives: The knowledge that the student receives in the course of "Biometrics" should become the basis for carrying out research work, writing term papers and final qualifying papers. During the laboratory course, students must master the following practical knowledge, skills and abilities: 1. experiment planning; 2. compilation of variation series based on a set of empirical data, calculation of the main statistical indicators and their evaluation; 3. parametric and nonparametric methods for testing statistical hypotheses; 4. correlation, variance and regression analysis.
Content of the course	The course includes questions: data collection and rational organization of research in the field of biology and statistical processing of results; to get acquainted with the methods of statistical processing in biological research; solving problems of determining the arithmetic mean, arithmetic error, standard deviation, Student's criterion, ANOVA test, regression and correlation. The content of the discipline: Metrology is the science of measurements, methods

	and means of ensuring their unity and ways to achieve the required accuracy. The subject of metrology is the extraction of quantitative information about the properties of objects with a given accuracy and reliability; the regulatory framework for this is metrological standards. Biometrics is an applied science that studies specific biological objects using mathematical methods. The objectives of the course include the study of experimental planning, familiarity with the numerical characteristics of the description of empirical data, the study of distribution laws, the construction of statistical estimates, parametric and nonparametric methods of testing statistical hypotheses, variance, correlation and regression.
Examination forms	During the academic semester, two intermediate controls are carried out (the first after the seventh week of study and the second after the fifteenth week before the exam) for an oral examination of students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket consists of three questions, and the student is given 30 minutes to prepare. Oral exam. The assessment of knowledge in the discipline provides for the formulation of additional questions, to which the student gives oral explanations in the conversation.
Study and examination requirements	Boundary control 1 Student must pass 5 essays, write a test, participate in seminars, defend 1 presentation. Boundary control 2 The student must pass 4 essays, write a test paper, take part in seminars, defend 1 presentation. The result: The student is obliged to provide lecture notes, notes of independent studies, to take an oral survey on the topics studied. The student should know the basics of creating the foundations of the general theory of measurements, the development and standardization of methods and measuring instruments, methods for determining the accuracy of measurements, the basics of ensuring the unity of measurements and the unity of measuring instruments, the basics of mathematical statistics, processing the results of observations, experiments and research, grouping experimental material, highlighting the most important statistical indicators of accuracy and criteria of materiality, measuring randomness and others. The student should be able to master the skills of statistical processing. Grouping of data, analysis of results. The student must understand the meaning and significance of statistical methods of processing empirical material. Mandatory attendance of classroom classes, active participation in the discussion of issues, preliminary preparation for lectures and seminars on the textbook and basic literature, high-quality and timely performance of tasks of the SRS, participation in all types of control (current control, control of the SRS, intermediate control, final control).
Technical and electronic learning tools	Interactive whiteboard, projector, computer https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/
Reading list	1. Lakin G.F. Biometrics. Mu: Higher. shk. 2020.352p 2. Bedritskaya T.V., Nakvasina E.N. Biometric methods in ecology and biology. Arkhangelsk, 2017., 40s. 3. B.P. Van der Waarden, Mathematical Statistics. Moscow: 2019. 4. Glotov N.V., Zhivotovsky L.A., Khovanov N.V., Khromov-Borisov N.N. Biometrics. L.: 2016 5. Kurshakova B.S. Correlation and regression analysis in practical application. Theory of breeding in plant populations. 6. Plokhinsky N.A. Biometrics. Moscow: 2020.

Module 19

Course code and name	ECOL 23006 Digital environmental research processing methods
Semester(s) when the course is taught	3
Person responsible for the module	Daribay Ainur - PhD, senior lecturer of the department

Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Showing short videos on the topic of the lecture Seminar tasks (practice): brainstorming, group work, communicative method, 6 hats method, cinquain method. Tasks of the CDS: Each subgroup prepares scientific news on the topic for the last 3 years; videos will be organized on the topic of practical work, presentations and debates on the topic
Workload (incl. contact hours, self-study hours)	lecture-30, seminar-30, self-study -120, total-180
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	Ecological toxicology, biogeochemical monitoring
Course objectives/intended learning outcomes	Goal: To master the theoretical and practical skills of digital processing of environmental studies Know-analysis of experimental material, as well as various mathematical and statistical formulas and methods, compiling a variational series for planning an experiment, calculating an empirical data set and basic statistical indicators. Skills: knowledge of parametric and non-parametric methods of statistical predictive testing, conducting correlation, variance and regression analyses, processing the results of observations. Students know how to apply knowledge in the field of biology to master general professional disciplines and solve professional problems. Competencies: Basic concepts in the field of ecology, theoretical knowledge, fixed in practical classes, form a scientific worldview.
Content of the course	The course "Digital Methods of Processing Ecological Research" is a necessary discipline in the preparation of environmental specialists. Many environmental, genetic, cytological, microbiological, radiobiological conditions in ecology may require the use of digital processing. Digital statistical methods are necessary when setting up experiments.
Examination forms	The exam is conducted orally. Each exam ticket consists of three questions, the student is given 30 minutes to prepare.
Study and examination requirements	Midterm control 1 The student must pass 5 abstracts, write a control, participate in seminars, defend 1 presentation. Midterm control 2 The student must pass 4 essays, write a test, take part in seminars, defend 1 presentation. Outcome: The student is obliged to provide lecture notes, notes of self-study, pass an oral survey on the topics studied. The third question of the examination questions in this discipline is evaluated by calculations.
Technical and electronic learning tools	ERA program GIS methods Microsoft teams learning platform https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/
Reading list	1. Tikhonov, A.N. Zertteu nәtizhelerin statisticalyқ өңdeu. Moscow, 2001 2. Eight, E.O. Korshagan orta statisticasy / Statistics of suraqtary. Moscow 2013 3. Aukabirov H.Ә. Biometrics, Almaty, 2011

Module 20

Course code and name	ECOL 23007 Bioindicator methods of research
Semester(s) when the course is taught	3

Person responsible for the module	Zhantokov B.Zh. Masenov K.B.
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Showing short videos on the topic of the lecture Workshop tasks (practice): Divide the group into several subgroups. Each subgroup prepares individually, and each subgroup makes its own calculation on the topic of practical work The tasks of the student's independent work: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations and debates on the topic will be organized. 6 hats method, cinquain method, interactive method, differentiated approach, project method, lecture-conference, hot chair method, model method (simulation of a real situation).
Workload (incl. contact hours, self-study hours)	lecture-30, seminar-30, independent work -120, total-180
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, you need to know the basics of biology, geography, chemistry, physics, as well as related disciplines Biology, biodiversity of biocenoses, Introduction to the specialty, bioecology.
Course objectives/intended learning outcomes	The purpose of studying the discipline: To give the theoretical foundations (principles and types) of bioindication at different levels of organization of life in various environments, as well as to teach practical skills in using bioindication and biotesting methods. The tasks of studying the academic discipline: The objectives of the course are to give students the skills to use the acquired theoretical and practical knowledge in solving theoretical problems and practical problems related to the assessment of environmental pollution. In the course of studying the subject, students should clearly focus on the clarity of the tasks set in the study: namely, which indication is better to use: specific or non-specific, expensive or express assessment, etc. That is, the ability to make the right choice from numerous methods is also difficult task that requires proper qualifications.
Content of the course	Bioindication is an applied science that is an integral part of environmental monitoring - monitoring the state of the environment. The tasks of bioindication include regular assessment of the quality of the environment using living objects specially selected for this purpose, because, ultimately, only on the basis of the study of living objects can we give an idea of the ecological well-being of the studied environmental objects. The course Bioindication Research Methods gives an idea of the basic requirements for practical work, criteria for assessing the environment, equipment, methods of bioindication at various levels of the organization of living beings. It will characterize individual test objects used for environmental bioindication.
Examination forms	The exam is conducted orally. Each exam ticket consists of three questions, the student is given 30 minutes to prepare.
Study and examination requirements	Midterm control 1 The student must pass 5 abstracts, write a control, participate in seminars, defend 1 presentation. Midterm control 2 The student must pass 4 essays, write a test, take part in seminars, defend 1 presentation. Outcome: The student is obliged to provide lecture notes, notes of self-study, pass an oral survey on the topics studied.
Technical and electronic learning tools	ERA program GIS methods Microsoft teams learning platform https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/

Reading list	Bioindication of the state of the environment: a textbook for students of higher educational institutions / R.R. Beisenova, L. V. Kubrina, E. V. Donets, A. I. Gigoriev; Ministry of Education and Science of the Republic of Kazakhstan, Eurasian National University. L. N. Gumilyov. – Astana, 2016. Bioindication of the quality of the natural environment Authors: Zhukova Anna Anatolyevna; Mastitsky Sergey Eduardovich. Belarus, Europe Minsk: BSU, 2014. Biomonitoring of the state of the environment: a textbook for students and undergraduates of higher educational institutions / R. R. Beisenova, L. V. Kubrina, E. V. Donets, A. I. Grigoriev. - Almaty: Evero, 2014.

Module 21

Course code and name	ECOL 23008 Ecological Geology
Semester(s) when the course is taught	3
Person responsible for the module	Adilbektegi G. - Candidate of Geographical Sciences, Associate Professor of the Department
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Case study, brainstorming, group work, communicative method, 6 hat method, cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (simulation of a real situation). Lecture: Multimedia lecture. a lecture developed by the author of the discipline. Questions and answers Showing short videos on the topic of the lecture Workshop tasks (practice): Divide the group into several subgroups. Each subgroup is prepared individually, and each subgroup makes its own calculation on the topic of practical work Tasks of the SRS: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	Total workload: 180 hours. Lectures: 30 hours, practical: 30 hours, independent work of students: 150 hours.
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	Introduction to the specialty, biogeochemical monitoring, ecology of animals and plants
Course objectives/intended learning outcomes	Purpose: Land management, structure, features of geology, geodynamic processes, endogenous, exogenous, technogenic processes, formation of natural and anthropogenic systems, dynamics, etc. Know the features of the relief, structure, faults, the dynamic state of the Earth's surface, as well as expertise on practical necessity. Be able to: organize ecological and geological studies in order to assess and forecast the ecological situation for various economically developed territories, and natural and man-made objects. Skills -analysis of the environmental impact of the main functions of the lithosphere on the body and man, collection, processing and use of geological information.
Content of the course	The study of the structure of the Earth's crust, the features of geodynamic processes, endogenous, exogenous, technogenic processes, the formation of natural and anthropogenic systems, the dynamics of changes in geological processes, ways to prevent them. Analysis of the environmental impact of changes in the main functions of the lithosphere on the environment and humans, collection, processing and use of geological information.
Examination forms	During the academic semester, two intermediate examinations are conducted (the first after the seventh week of study and the second after the 15th week before the exam) to test students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	The exam in the discipline "Ecological Geology" is given orally. Firstly, in order to comprehensively test the knowledge of students, in-depth

	determination of their speech skills, the ability to express their thoughts, oral communication is necessary. Secondly, exam questions on a given discipline can be evaluated in the form of examples. Thirdly, only the oral method of the exam allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	Projector, computer
Reading list	1. Vasilyeva, M.Yu. Geoecological features of geospheres: a textbook / M.Yu. Vasiliev. Saratov: Nauka, 2011. 84 p. ISBN 978-5-9999-0981-7. 2. Golubev, G.N. Fundamentals of Geoecology: textbook / G.N. Golubev. 2nd ed. Erased. Moscow: KnoRus, 2016. 352 p. 3. Koronovsky, N.V. Geology: textbook / N.V. Koronovsky, N.A. Yasmanov. 9th ed., erased. Moscow: Academy, 2014. 448 p. https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/

Module 22

Module code and name	ECON 22001 Entrepreneurship and business
Semester(s) when the module is taught	4
Person responsible for the module	Ryspekova M.O.
Language of instruction	English
Within the curriculum (cycle, component)	General education (optional component)
Teaching methods	Overview, informational, problem lectures in the form of presentations, the method of conducting lectures are combined into three main elements: presentation of new material, formulation of problematic questions, joint search for answers, solving problem cases.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5
Required and recommended prerequisites for joining the module	Recommended prerequisites: knowledge of the basics of economics in the framework of the secondary school program "Economics and Entrepreneurship".
Module objectives / expected learning outcomes	"Entrepreneurship and business" is the acquisition of the necessary skills of entrepreneurship, understanding the mechanism of functioning of the market structure in business. Knowledge: familiarity with the theory of business and entrepreneurship, systematization of regulatory, economic, organizational and managerial knowledge on the formation and conduct of entrepreneurship and business. Skills: cognitive and practical skills, for the development of entrepreneurial thinking for solving specific tasks and business situations. Skills of preparation, evaluation and implementation of business development projects in various sectors of the economy; skills in organizing, reorganizing and liquidating entrepreneurial firms and preparing working documentation - tools for regulating economic relations between business entities. Competencies: to form students' readiness for entrepreneurial activity and for the organization of their business. Skills of preparation, evaluation and implementation of business development projects in various sectors of the economy. Collect, analyze and process the data necessary to solve the set economic tasks in the field of organization and business development; To select and apply tools for processing economic data in the field of business organization and management in accordance with the task, analyze the results of calculations of economic efficiency and justify the conclusions.

Content of the module	Introduction to the course "Entrepreneurship and business". The essence of business and entrepreneurship. Goals, functions and general characteristics of the business. The system of modern business: subjects of business relations, business infrastructure, government support. Forms of business. Small, medium and large businesses. Registration of an entrepreneurial company. Organization of an entrepreneurial firm. Reorganization and termination of the company. Economic activity in the business system. Competition in business. Business activity and contracts of the company. The tax system in business. Business interests in business. Entrepreneurial risk. Innovative entrepreneurship. Business infrastructure.
Examination forms	The exam is conducted orally
Study and examination requirements	The organization of the lesson using active forms and methods of the educational process, mandatory control. The exam serves as a form of checking the educational achievements of students throughout the professional curriculum of the discipline and provides for the development of educational achievements of students during the academic period, the theoretical knowledge gained, the strength of their assimilation, creative thinking, independent work skills.
Technical and electronic learning tools	Types of technical means: computers, interactive whiteboards, projectors. Teaching methods using visualization (presentation).
Reading list	1. Esirkepova A.M. Modern entrepreneurship: a textbook / A.M. Esirkepova. - Almaty: New book, 2020. – 304 p . 2. Baigelova A.N. Fundamentals of entrepreneurship: textbook /A.N. Baigelova, Zh.E. Sadykova, T.M. Nasymkhan. - - Almaty: Lankar Trade, 2019. - 292 p. 3. Ryspekova M.O. Fundamentals of entrepreneurship: study guide. - Almaty: Epigraph, 2019. – 231 p. 4. Maidyrova A.B. Entrepreneurship and business: cases, business games, tasks and schemes: textbook /A.B. Maidyrova, R.A. Baizholova. - - Nursultan: L.N. Gumilyov ENU, 2020. – 172 p. 5. Maidyrova A.B. Economics of small and medium-sized enterprises: textbook /A.B. Maidyrova, M.O. Ryspekova. - - Nursultan: L.N. Gumilyov ENU, 2019. - 251 p.

Module 23

Module code and name	CULS 22005 Rukhani Zhangyru
Semester(s) when the module is taught	4
Person responsible for the module	Battalov K.K.
Language of instruction	English
Within the curriculum (cycle, component)	General education (optional component)
Teaching methods	Overview, informational, problem lectures in the form of presentations, the method of conducting lectures are combined into three main elements: presentation of new material, formulation of problematic questions, joint search for answers, solving problem cases.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5
Required and recommended prerequisites for joining the module	Modern history of Kazakhstan
Module objectives / expected learning outcomes	The course highlights topical issues of modernization of modern Kazakh society. The course is aimed at forming an idea of modern global trends in post-industrial development of society, a vision of their own and the world's future, awareness of the trend in the development of the world labor market, an idea of Kazakhstan's identity, the main directions of development of the spiritual modernization of the country. The course covers basic knowledge about leadership strategies in society. The world examples of leadership in different historical periods are considered.

Content of the module	The educational program is based on three conceptual foundations: cognitive – the study of the basics of modernization of public consciousness and the laws of development of modern society; patriotic – respect for history, the heroic past of their people, love for the Fatherland, native land, historical figures, involvement in national values; informational – popularization of spiritual and moral values that strengthen national identity, clarification of tasks defined in the Program Article of the Head of State, strategic documents of the country, the President's Message to the people of Kazakhstan. The discipline consists of 3 modules: 1. Modernization in the context of globalization. The world of the future. 2. Modernization of consciousness as a factor of success of the nation. 3. Leadership in the conditions of modernization.
Examination forms	The exam is conducted orally
Study and examination requirements	The activity of students in the educational process is mandatory, which is evaluated by the quality of their performance. Attendance of classes and participation in the educational process are mandatory. Students should not miss classes without a good reason. Tardiness is not allowed. The Code of Conduct and Ethics must comply with the requirements of the university. In this regard, scores from 0 to 100 points are given.
Technical and electronic learning tools	Types of technical means: computers, interactive whiteboards, projectors. Teaching methods using visualization (presentation).
Reading list	1. Nazarbayev N. A. looking to the future: modernization of public consciousness // Kazakhstanskaya Pravda, 2017. - April 12. 2. Nazarbayev N. era of independence. - Astana, 2017. - 508 P. 3.President of the Republic of Kazakhstan N. A. Nazarbayeva "social initiative of the President" // http://www.akorda.kz 4. Yuval NOI Harrari. "Homo Deus: the history of the future". Moscow: Sinbad, 2018. - 496 P. 5. Kuttykadam S. "10 examples of the service of the nation". - Almaty: Ines-TSA, 2009.356C. 6. Abay Kunanbayev. Izbrannoe (Series" wise vekov"), Moscow, 2006 7. address of the head of State to the people of Kazakhstan dated January 31, 2017 "the third modernization of Kazakhstan: tolerance on a universal basis" / / http://www.akorda.kz 8. Nazarbayev N. on the wave of history. - Almaty: "Atamura", 1999 9. strategy "Kazakhstan-2050" direction of the new policy of the established state. Address of the president of the Republic of Kazakhstan – Elbasy N. A. Nazarbayev to the people of Kazakhstan, Astana, December 14, 2012 // http://adilet.zan.kz/kaz/docs/K1200002050 10. Terminasova S. G. language and intercultural communication. - Almaty; Astana, 2018.

Module 24

Module code and name	CSSE 22002 Digital technologies by branches of application
Semester(s) when the module is taught	4
Person responsible for the module	Mukhtarova A.J.
Language of instruction	Russian
Within the curriculum (cycle, component)	General education (optional component)
Teaching methods	Overview, informational, problem lectures in the form of presentations, the method of conducting lectures are combined into three main elements: presentation of new material, formulation of problematic questions, joint search for answers, solving problem cases.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5
Required and recommended prerequisites for joining the module	Information and communication technologies

Module objectives / expected learning outcomes	Purpose: to introduce students to the prospects and examples of the use of digital technologies to improve the efficiency and quality of their activities. Knowledge: – to study the basic concepts of digital technologies, platforms and mobile devices; – know the specifics of using multimedia on the Internet; – be able to effectively use digital technologies and Internet resources; – develop multimedia content; – use the functionality of social networks; – use various means of processing and storing digital information; – analyze the reliability of means and methods of protection in the network; Competencies: – formation of students' skills and abilities necessary for their further professional activity; – evaluate the effectiveness of digitalization in professional fields. – synthesize the effective use of Internet services for work and life.
Content of the module	Introduction to the course. The state program "Digital Kazakhstan". Smart city. Basic concepts. Platforms and technologies of the organization. Smart Astana roadmap. Computer networks. The Internet. Internet access technologies. Internet by wire. Internet without wires. Mobile Internet. Mobile networks (3G, 4G/LTE). Cellular systems. Digital platforms for electronic public services. Electronic digital signatures (EDS). Information system "Electronic licensing". Digital e-commerce platforms. E-commerce. Virtual means of payment and systems. Online stores. Online shopping. Information security on the Internet. Cybersecurity. Strong passwords. two-step authentication. 3D modeling and animation. 3D graphics. 3D modeling. Virtual and augmented reality VR and AR. Introduction to Java. The Java programming language. Introduction to the Python programming language. Processing of digital information in the professional sphere. Organization of texts, transformation of text information. Processing of graphic images. Compression of digital information. Database. Big data and open data. Statistical processing of results using the STATISTICA program. Modern multimedia services. Social network. Search engines. Electronic catalogs, libraries. Video conferences. The use of cloud technologies for storing digital information. General concepts of cloud technologies. Advantages and disadvantages of cloud services.
Examination forms	Testing.
Study and examination requirements	The course "Digital Technologies by industry" is an optional component. The work must be completed within the specified time frame. Students who have not completed all the tasks are not allowed to take the exam. Revision of the topic and working out of the materials passed for each training session are mandatory. The degree of assimilation of the educational material is checked by testing. Students may be tested without warning.
Technical and electronic learning tools	Программы Python, Java, STATISTICA.
Reading list	1. Brown G., Sargent B., and Watson D. Cambridge IGCSE ICT. - London: Hodder Education Group, 2015. -439 p. 2. Williams B. K. and Sawyer S. Using information technology: A practical introduction to computers & communications. - New York: McGraw-Hil., - 8th ed. -2010. -563 p. 3. Watson D. and Williams H. Cambridge IGCSE Computer Science: Hodder Edu.; 3 ed. 2015.-278 p. 4. Evans V. Information technology. Books 1-3: English for specific purposes.- 5th impr.- Newbury: Express Publishing, 2014.- 40 p.

Module 25

Module code and name	LAWS 22006 Anti-corruption culture
Semester(s) when the module is taught	4
Person responsible for the module	Ibragimov Zh. I., Temirzhanova L.A.
Language of instruction	Russian
Within the curriculum (cycle, component)	General education (optional component)

Teaching methods	Overview, informational, problem lectures in the form of presentations, the method of conducting lectures are combined into three main elements: presentation of new material, formulation of problematic questions, joint search for answers, solving problem cases.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5
Required and recommended prerequisites for joining the module	School course "Human, society and law".
Module objectives / expected learning outcomes	The purpose of the anti-corruption culture is the education of values and the development of abilities necessary for the formation of a civil position in young people in relation to corruption, the formation of a negative attitude to corruption manifestations. Learning outcomes: Students will gain knowledge about the essence of corruption and the causes of its occurrence. Students will be able to analyze the measure of moral, ethical and legal responsibility for corruption offenses. Students will know the anti-corruption policy of the state and the current anti-corruption legislation. Students will be able to realize the values of moral consciousness and follow moral norms in everyday practice. Students will be able to identify legitimate actions in a conflict of interest situation.
Content of the module	The course "Fundamentals of Anti-Corruption Culture" is aimed at raising awareness about corruption and shaping its image as a problem of public policy. The purpose of the course is to form a system of knowledge on combating corruption, existing legal responsibility and on this basis to develop a civil position in relation to this phenomenon. The development of a legal culture of the individual contributing to the fight against corruption, the formation of skills and abilities of critical analysis of corruption phenomena, the study of modern anti-corruption approaches and practices.
Examination forms	Computer testing
Study and examination requirements	Students are required to attend lectures and seminars, pre-preparing for lectures and seminars based on textbooks and basic literature, participate in all types of control (current control, boundary control, final control), mandatory participation in intermediate and final certification tests, teacher assignments. The activity of work at the seminar (the ability to conduct a discussion, to argue your position with references to the literature under study, a creative approach to the selection and analysis of texts), the quality of individual written assignments (glossary, etc.) and creative work (essays) highly appreciated.
Technical and electronic learning tools	Types of technical means: computers, interactive whiteboards, projectors. Teaching methods using visualization (presentation).

Reading list	Main Links: 1. Fundamentals of anti-corruption culture: a textbook. Ed. B.S. Abdrasilova. – Astana: Academy of Public Administration under the President of the Republic of Kazakhstan, 2016. – 176 p . 2. Anti-corruption. Textbook and workshop. Under the general editorship of E.V.Okhotsky. – Moscow, 2016. – 146 p. 3. Anti-corruption: constitutional and legal approaches. Collective monograph/ ed. Avakian S.A. – M.: Justicinform, 2016. – 512 p. 4. Rose-Akkeman S. Corruption and the state. Causes, consequences, reforms. Moscow: Logos, 2010. 5. Anti-corruption legal policy: studies. Manual / E. Alaukhanov. – Almaty: Zan adebieti, 2009. – 256 p. 5. Morality as the basis for the formation of a new generation of civil servants. / Kabykenova B.S., Shakhanov E.A., Dzhusupova R.S. - 2011. 6. Bureaucracy, corruption and efficiency of public administration / V. D. Andrianov. - Moscow: Volters Kluver, 2009. - 248 p. - Bibliogr.: 234 p. 7. Corruption and the State: Causes, consequences, reforms: Translated from the English by O.A.Alyakrinsky / S. Rose-Ackerman. – M.: Logos, 2003. – 356 p. 8. Power, corruption and honesty: Scientific ed.: translated from English / A. A. Rogov. – M.: Publishing House of RAGS, 2005. – 176 p.

Module 26

Module code and name	ECLFST 22004 Fundamentals of ecology and life safety
Semester(s) when the module is taught	4
Person responsible for the module	Kobetaeva N.K.
Language of instruction	English
Within the curriculum (cycle, component)	General education (optional component)
Teaching methods	Overview, informational, problem lectures in the form of presentations, the method of conducting lectures are combined into three main elements: presentation of new material, formulation of problematic questions, joint search for answers, solving problem cases.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5
Required and recommended prerequisites for joining the module	School Biology course
Module objectives / expected learning outcomes	Formation of an ecological worldview, obtaining deep systemic knowledge and ideas about the basics of ecology and life safety, theoretical and practical knowledge about modern approaches to the rational use of natural resources and environmental protection. As a result of studying this discipline, students should know: - the main patterns of interaction between nature and society; - fundamentals of ecosystem functioning and biosphere development; - the impact of harmful and dangerous factors of production and the environment on human health; - the concept, strategies, problems of sustainable development and practical approaches to their solution at the global, regional and local levels; - fundamentals of environmental legislation; - principles of organization of safe production processes; be able to: - to assess the ecological state of the natural environment; - to assess the technogenic impact of production; have the skills to influence the environment: - study of the components of ecosystems and the biosphere as a whole; - determination of optimal conditions for sustainable development of ecological and economic systems; - conducting a logical discussion of topics related to solving environmental problems; - knowledge of standard methods of environmental monitoring.

Content of the module	Ecology and problems of modern civilization. Autoecology is the ecology of organisms. Demecology – ecology of populations. Synecology Is The Ecology Of A Community. The biosphere and its stability. Evolution of the biosphere. The concept of living matter. Modern biosphere. Global biogeochemical cycles. Ecological crisis and problems of modern civilization. Strategies, goals and principles of safety and vital activity. Green economy and sustainable development. Natural resource management. Ecoenergy. Global energy-ecological strategy for sustainable development of the XXI century. Water is a strategic resource of the XXI century. Renewable energy sources. Environmental policy of the Republic of Kazakhstan. The concept of sustainable development of the Republic of Kazakhstan. Protection of the atmosphere. Protection of water resources. Protection of land resources, soils and subsoil. Physical pollution of the environment. Protection of flora and fauna.
Examination forms	Computer testing
Study and examination requirements	Students are required to attend lectures and seminars, pre-preparing for lectures and seminars based on textbooks and basic literature, participate in all types of control (current control, boundary control, final control), mandatory participation in intermediate and final certification tests, teacher assignments. The activity of work at the seminar (the ability to conduct a discussion, to argue your position with references to the literature under study, a creative approach to the selection and analysis of texts), the quality of individual written assignments (glossary, etc.) and creative work (essays) highly appreciated.
Technical and electronic learning tools	Types of technical means: computers, interactive whiteboards, projectors. Teaching methods using visualization (presentation).
Reading list	1 Akimova T. A., Haskin V. V. Ecology. Man-economy-Biota-Environment: Textbook for university students / 2nd ed., reprint. and appendix-M: UNITY, 2009. – 556 p. 2 Bigaliev A.B. General ecology / Second edition, reprint. updated. - - Almaty: NUR PRESS Publishing House, 2011. 3 Denisova V. V. Ecology: Textbook – M., 2004. 4 Abubakirova K. D., Kozhagulov S. O. Ecology and Sustainable development. - Almaty, 2011 5 Columbayeva S.Zh. and others. Ecology and sustainable development. - Almaty, "Kazakh University", 2011 6 Alimov M.S. Ecology and sustainable development. - Almaty, 2012 7 Korobkin V. I., Peredelsky L. V. Ecology: Textbook for university students. - Rostov n/A: Phoenix, 2007-575 p. 8 Tonkopiy M. S., Satbaeva G. S., Ishkulova N. P., Anisimova N. M. Ecology of zhane terrorist attacks at home: okulyk: KR Bilim zhane gylym m-gi. Almaty: ZHSHS RPBC "Dauir", 2011-312 b. 9 Columbayeva S.Zh. Zhalpa ecology. - Almaty: 2006

Module 27

Module code and name	COMU 22003 Business rhetoric
Semester(s) when the module is taught	4
Person responsible for the module	Shakhin A.A., Tashimkhanova D.S.
Language of instruction	Russian
Within the curriculum (cycle, component)	General education (optional component)
Teaching methods	Overview, informational, problem lectures in the form of presentations, the method of conducting lectures are combined into three main elements: presentation of new material, formulation of problematic questions, joint search for answers, solving problem cases.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5
Required and recommended prerequisites for joining the module	Kazakh and Russian languages

Module objectives / expected learning outcomes	The goal is to develop effective public speaking skills, successful communication skills in various business communication situations. Know the basic rhetorical strategies and tactics, argumentation techniques aimed at achieving a communicatively significant result. Be able to apply knowledge about oratorios to the speech facts of business communication; build effective business communication in accordance with students' own communicative intentions. Have the skills of effective interaction with participants in the process of business communication in various genres of business communication.
Content of the module	The course has a professional and practical orientation. Its study involves mastering the technology of rhetorical activity in professionally significant situations. The objectives of the course include improving students' speech education, gaining knowledge about the principles of effective business communication, the main factors and processes that ensure the successful impact of public speaking on listeners, forms and means of interaction between the speaker and the audience. The student receives knowledge about the main rhetorical strategies and tactics aimed at achieving a communicatively significant result; the basics of public speaking skills; knowledge of the terminological apparatus for the course; the ability to perform tests of an official business orientation, to realize their own communicative intentions and build effective business communication in accordance with this.
Examination forms	Combined exam
Study and examination requirements	The activity of students in the educational process is mandatory, which is evaluated by the quality of their performance. Attendance of classes and participation in the educational process are mandatory. Students should not miss classes without a good reason. Tardiness is not allowed. The Code of Conduct and Ethics must comply with the requirements of the university. In this regard, scores from 0 to 100 points are given.
Technical and electronic learning tools	Types of technical means: computers, interactive whiteboards, projectors. Teaching methods using visualization (presentation).
Reading list	1. Sternin I.A. Practical rhetoric: studies. manual for students of higher educational institutions. – M.: "Academy", 2016. – 272 p. 2. Shelamova G.N. Etiquette of business communication: studies. manual for the beginning of Prof. education. – M.: "Academy", 2015. – 192 p. 3. Vvedenskaya L.A. Business rhetoric: A textbook for universities. – Rostov n/A, 2012. 4. Malkhanova I.A. Business communication: studies. manual. – M.: Academic project, 2014. – 224 p. 5. Anisimova T.V., Gimpelson E.G. Modern business rhetoric: studies.manual. – M. : NPO "MODEK", 2017. – 432 p. 6. Golub I.B. Rhetoric: studies. manual. – M.: "Eksmo", 2015. – 384 p. Kuzin F. A. Culture of business communication. – M., 2017.

Module 28

Course code and name	ECOL 22001 Ecological biogeography
Semester(s) when the course is taught	4
Person responsible for the module	AkbayevaLyailya, candidate of biological sciences, professor of the department
Language	English
Within the curriculum (cycle, component)	Basic discipline (University component)
Teaching methods	Informational or problematic lecture Seminar assignments (practice): Seminar in the form of a conference, debate, oral survey SIW tasks: performing tasks on the topic of the lecture: essays, watching videos, reading special literature. Case study, brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS

Required and recommended prerequisites for joining the course	Biology, Geography, Chemistry, Physics, Biodiversity of biocenoses, Introduction to the specialty, Bioecology.
Courseobjectives/intendedlearningoutcomes	Purpose: have basic knowledge of the geography of living organisms, understand the basic laws of their distribution in the biosphere as a whole, apply knowledge for the organization of biogeographic monitoring. Objectives of studying the academic discipline: - to give knowledge about the basic laws of the distribution of living organisms on the Earth; - to give concepts about the biosphere, to study the main limits of the distribution of living organisms, their composition, productivity and biomass; - study the ecological foundations of biogeography, assess environmental factors and their interaction; - show the geographical patterns of differentiation of the living cover of the land; - to study the basics of chorology (the doctrine of the area) and the patterns of the modern geographical distribution of the main groups of living organisms, the types and causality of the configuration and breaks of areas; - to consider the main reasons for the dynamics of habitats and changes in the composition of living organisms; - to consider the floristic and faunistic zoning of the land, to characterize the faunistic and floristic areas; - to study the composition, structure and characterize the features of faunistic and floristic elements; - to study the geography of cultivated plants and domestic animals; - to characterize the main types of land biomes; - to consider modern zoning and assess the biodiversity of organisms distributed on land and in the World Ocean; - to study modern issues of biodiversity protection and rational use of biological resources.
Content of the course	Course studies physiographic (climatic, hydrological, geomorphological, soil geochemical), paleographic characteristics of the territory, the main goal of biogeography, patterns of geographical distribution of organisms and communities. Tools to achieve the goal: motivation of students to research, independent work of students with a teacher, practical work in laboratory classes, work experience. A number of basic provisions of modern biogeography are considered, in particular, the regularities of the distribution of plants and animals on the Earth are highlighted, information on the areas of endemic taxa of plants and animals of various floristic and faunistic regions is presented, the principles of floristic and faunistic zoning are substantiated, and the features of vegetation and fauna of the main biomes are considered.
Examination forms	The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare. Oral examination, The assessment of knowledge in the discipline provides for the formulation of additional questions, for which the student gives oral explanations in the conversation.
Study and examination requirements	Milestone 1 The student must pass 5 essays, write a test, participate in seminars, defend 1 presentation. Milestone 2 The student must pass 4 essays, write a test paper, participate in seminars, defend 1 presentation. Final: The student is obliged to submit lecture notes, self-study notes, take an oral survey on the topics studied. The student must be able to operate with basic ecological concepts, systemic concepts of the interaction of biological systems of different levels of organization with the environment, ready to explain the essence of fundamental environmental laws and phenomena; I am ready to use the results of geographical research to predict the development of natural and socio-economic processes. Mandatory attendance at classrooms, active participation in discussion of issues, preliminary preparation for lectures and seminars on the teaching aid and basic literature, high-quality and timely completion of tasks of the IWS, participation in all types of control (current control, IWS control, midterm control, final control).
Technical and electronic learning tools	Multimedia projector, computer, interactive whiteboard
Reading list	Biogeography [Text]: textbook / G.M. Abdurakhmanov et al. - 2nd ed. - M .: Academy, 2017.- 480 p. Mashkin for universities / V.I. Mashkin. - 2nd ed. - M : "Academic project" 1. 2., 2016. - 384 p.

	Petrov, K.M. Biogeography: textbook / K.M. Petrov. - M .: Academic project, 2018 .-- 400 p. Vlasova, T.V. Physical geography of continents and oceans [Text]: textbook / T.V. Vlasova, M.A. Arshinova, T.V. Kovaleva. - M .: Academy, 2020 .-- 340 p. Ivanov, V.A. Fundamentals of Oceanology [Text]: textbook. allowance / V.A. Ivanov, K.V. Pokazeev, A.A. Schrader. - SPb .: Lan, 2018 .-- 576 p., V.I. Zoogeography: a tutorial. Microsoft teams Google (Google Class/ GoogleForms)

Module 29

Course code and name	ECOL 22002 Social ecology
Semester(s) when the course is taught	4
Person responsible for the module	1. Akbayeva Lyailya, candidate of biological sciences, professor of the department
Language	English
Within the curriculum (cycle, component)	Basic discipline (University component)
Teaching methods	Informational or problem lecture Tasks of the seminar (practice): Seminar in the form of a conference, debate, oral interview Tasks of the SRS: performing tasks on the topic of the lecture: abstracts, watching videos, reading special literature. Synquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (simulation of a real situation).
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, self-study-105, total – 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, it is necessary to know the basics of biology, geography, chemistry, physics, as well as related disciplines Biology, biodiversity of biocenoses, Introduction to the specialty, bioecology.
Course objectives/intended learning outcomes	Purpose: formation of the ecological culture of the individual through familiarization with the basics of the functioning of socio-natural systems, the principles of interaction between man, society and nature. The purpose of studying the discipline. Provide the philosophical and methodological training of students for their understanding of the peculiarities of the development of the general ecological culture of the individual, improving the professional and pedagogical culture of future specialists through familiarization with the basics of the organization and functioning of socio-natural systems, the principles of human interaction. society and nature, the laws of human functioning and development in the living environment, the conceptual foundations of environmental education and upbringing. The tasks of studying the discipline. Form ecological thinking in students To instill the skills of educational work in order to form an ecological culture among the population. to acquaint students with the basics of general and social ecology, human ecology, nature management, environmental pedagogy; Ensure the continuity and consistency of environmental education at the stages of general education and vocational training; increase the level of professional competence of students by establishing a system of intersubject connections between the course content and the content of the major disciplines.
Content of the course	Course studies the evolution of the relationship between man and nature, consideration of the basic laws of the relationship of nature and society; analysis of various aspects of the global transformation of the modern world, identifying trends and characteristics of the formation of environmental culture and environmental thinking. Tools to achieve the goal: the motivation of students to sociological research, independent work of students with a teacher.

	At the present stage, the survival of mankind, social progress depends on the state of the "nature-society" system. Environmental and social issues are inextricably linked. However, nurturing environmental motivation is a difficult task. The progress of society is often identified with an increase in the consumption of material goods, which entails an increase in the exploitation of natural resources. The modern way of life is unthinkable without the press, television, communications, and recreation services. All developing countries are striving to create a consumer society. However, for every step of civilization, mankind pays too expensive a fee, which results in ecological disasters accompanying the growth of the gross product and the cost of its production.
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare. Oral examination, The assessment of knowledge in the discipline provides for the formulation of additional questions, for which the student gives oral explanations in the conversation.
Study and examination requirements	Milestone 1 The student must pass 5 essays, write a test, participate in seminars, defend 1 presentation. Milestone 2 The student must pass 4 essays, write a test paper, participate in seminars, defend 1 presentation. Final: The student is obliged to submit lecture notes, self-study notes, take an oral survey on the topics studied. The student is required to be able to give an in-depth analysis of the problems of society and relations with nature accompanied by the fact that only public policy and the actions of society are filled with rationality, overflowing with environmental problems and that each member of the community can only be avoided when environmental awareness is achieved. Compulsory attendance at classrooms, active participation in the discussion of issues, preliminary preparation for lectures and seminars on the teaching aid and basic literature, high-quality and timely completion of IWS assignments, participation in all types of control (current control, IWS control, midterm control, final the control).
Technical and electronic learning tools	https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/
Reading list	Markovich D.Zh., Social Ecology.-M., 2018 Moiseev N.N. Philosophical aspects of social ecology.-M., 2019 Losev A.V., Provadkin G.G., Social ecology.-M., 2016. Deryabko S.D., Yasvin V.A. Environmental pedagogy and psychology. - Rostov-on-Don: Phoenix. 2016.- 480 p. White L. The Historical Roots of Our Ecological Crisis. // Global problems and universal values.-M., 2020.

Module 30

Course code and name	ECOL 23009 Evolution of the biosphere
Semester(s) when the course is taught	4
Person responsible for the module	Akbayeva Lyailya, candidate of biological sciences, professor of the department
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Lecture: Traditional, problem-based, multimedia lecture. An s wersto control questions. Showing short videoclips on the topic of the lecture. Tasks for the seminar (practice): Case study, brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method, lecture-conference, “hot chair” method, model method (real situation modelling).
Workload (incl. contact hours, self-study	lecture -15, seminar -30, self-study-105, total – 150

hours)	
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Existing competencies in biology, evolution aryscience, chemistry, ecology, soil, water, airecology, geology, poleontology, mathematics. List ofrelatedsubjects: biology, chemistry, environmental physics, animaland plant ecology.
Course objectives/intended learning outcomes	Objectives: The purpose of this course is to form an idea of the ecological evolution of the biosphere, the most rapid development of civilization in order to preserve the habitat. Students should know: the basic concepts of the origin of the solar system, the Earth and the biosphere, the stages of the origin of life, the biospheric microflora of the main group of living organisms, the laws of the ecological functioning of the biosphere. In order to: substantiate the conditions for the stability of the biosphere and the values of all its constituent types of organisms; Identify Fjandar Goethem against his biosphere evolution
Content of the course	The course "Evolution of the Biosphere" explores the problems of the origin and development of the biosphere over 4.5 million years of the Earth's mild existence as a planet, reveals thematic patterns and methods of identifying the evolution of groups of organisms, the formation of marine and marine organisms. Terrestrial ecosystems, the impact of life development on the state of a healthy environment, major events, causes of environmental crises in the history of the Earth, irresistible consequences for biota. The content of the discipline consists of topics; 1. The structure of the hebiosphere 2. Solar radiation and its formation. 3. Neighborhood and geographic areas 4.History of the Hebiosphere 5. Geochronological scale and history of organisms. 6 the future of the biosphere
Examination forms	During thea cademic semester, two intermediate controlsareheld (thefirst after the sevent hweekof studyand thesecond after the fifteent hweekbeforetheexam) toteststudents' knowledgeorally. Time for intermediate controlis 50 minutes. The examiscon ductedorally. Eachexam ticket hasthree questions and the studentisgiven 30 minutes toprepare
Study and examination requirements	The exam on the subject of Evolution of the biosphere is taken orally. Because: First of all, in order to fully test the knowledge of students, a deep definition of the irspeakingskills, theabilityto express theirthoughtsisdeterminedonlyby oral communication. Second, the third question oft heexam quest ions oft hisdis ciplinecan beassessed in the form of calculations, and itcan beassesse donlybyask ing the meaningof oral formulas. Thirdly, I thinkthatonlythe oral exammet hodallow syoutofully assesstheknow ledgeofstudents (forexample, toask additional questions).
Technical and electronic learning tools	https://kahoot.com/ https://www.microsoft.com/
Reading list	1.Earthscience: geoecology: textbook / Barskov I.S .; otv. ed. A. V. Smurov. M.:KDU, 2010, 563 p. 2.Eskov K. Yu. Amazingpaleontology. Historyofthe Earth andlife on it. M: ENASKNIGA, 2012.312 p. 3.BakhovZh.K., Ashitova N.Zh. The origin and evolution of the biosphere of Almaty: Epigraph, 2016. ISBN 978-601-310-388-4. 152 B Works in group communicatife method.

Module 31

Course code and name	ECOL 23010 Environmental studies

Semester(s) when the course is taught	4
Person responsible for the module	Nurgalieva Z.Zh.
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Case study, brainstorming, group work, communicative method, 6 hat method, cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (simulation of a real situation). Lecture: Multimedia lecture. a lecture developed by the author of the discipline. Questions and answers Showing short videos on the topic of the lecture Workshop tasks (practice): Divide the group into several subgroups. Each subgroup is prepared individually, and each subgroup makes its own calculation on the topic of practical work Tasks of the SRS: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, it is necessary to know the basics of biology, geography, chemistry, physics, as well as related disciplines Biology, biodiversity of biocenoses, Introduction to the specialty, bioecology.
Course objectives/intended learning outcomes	To teach the student to identify possible ways to restore disturbed areas; to analyze knowledge about the ecological possibilities of natural systems and the limits of their sustainability. Students must: know the objects of the human environment, the components of the biotic, abiotic and social environment, their interaction; understand the patterns of interaction between man and the environment; own the basics of environmental management; the course stimulates students to a deeper study and analysis of environmental problems
Content of the course	“The doctrine of the environment" - a discipline about the environment, the dynamics of its change and the impact on the biosphere, the main components of the environment, the concept of living matte
Examination forms	During the academic semester, two intermediate examinations are conducted (the first after the seventh week of study and the second after the 15th week before the exam) to test students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes
Study and examination requirements	The exam in the discipline is given orally. Firstly, in order to comprehensively test the knowledge of students, in-depth determination of their speech skills, the ability to express their thoughts, oral communication is necessary. Secondly, exam questions on a given discipline can be evaluated in the form of examples. Thirdly, only the oral method of the exam allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	Projector, computer https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/ Google Maps
Reading list	1. Columbayeva, S.Zh. Ecology of zhane turakty damu: oku kuraly / S.Zh. Columbayeva, R.M. Bildebayeva, M.A. Sharipova.-Almaty: Kazakh University, 2012. 2. Askarova U.B. Ecology zhane korshagan ortany korgau.Almaty, 2009 3. Bulekbaeva, K.B. Ecology of zhane korshagan ortany korgau: okulyk / K.B. Bulekbaeva.-Almaty: Evero, 2011

	4. Mammadov N.M. Introduction to the theory of stability. Course of lectures / N.M. Mammadov. – M.: Step, 2018. – 240 p. 5. Demina, S.A. The law on nature protection / S.A. Demina. – M.: Legal literature, 2017. – 700 p. 6. Kurok, M.L. On environmental protection / ed.Galeeva, M.L. Trigger. - M.: Politizdat; Edition 2, supplement, 2017. - 384 p.

Module 32

Course code and name	ECOL 23011 Medical Ecology
Semester(s) when the course is taught	4
Person responsible for the module	BeisenovaRaikhan - Doctor of Biological Sciences
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Case study, brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method SIW tasks: Each subgroup prepares scientific news on the topic for the last 5 years; videos on the topic of practical work, presentations, and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Biogeochemical monitoring, Bioecology, Ecological toxicology
Courseobjectives/intendedlearningoutcomes	Purpose: to teach to identify aspects of the impact of the environment on public health. Students know: population health indicators, factors shaping human health; diseases associated with adverse climatic conditions, social factors; basics of preventive medicine. Students can: interpretate of the results of complex diagnostic methods for assessing the health of the population. Encourages students to study regional issues of ecology and public health.
Content of the course	Medical descriptions of environmental factors and their impact on public health.
Examination forms	The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	The oral exam in the discipline involves questions on the course materials to which the student must answer. In case of controversial points during the exam, the teacher asks additional questions to clarify and complete the answer.
Technical and electronic learning tools	Multimedia projector, computer, interactive whiteboard https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/ Google (Google Class/ GoogleForms) Microsoft teams
Reading list	Medical ecology. A.N.Stozharov. Minsk, 2007. 370 p. Medical ecology. V.P.Ivanov., N.V. Ivanova., A.V.Polonikov. Saint Petersbourg, 2012. 300 p.

Module 33

Course code and name	ECOL 23012 Biogeochemical provinces
Semester(s) when the course is taught	3

Person responsible for the module	Adilbektegi G. - Candidate of Geographical Sciences, Associate Professor of the Department
Language	English
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Case study, brainstorming, group work, communicative method, 6 hat method, cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (simulation of a real situation). Lecture: Multimedia lecture. a lecture developed by the author of the discipline. Questions and answers Showing short videos on the topic of the lecture Workshop tasks (practice): Divide the group into several subgroups. Each subgroup is prepared individually, and each subgroup makes its own calculation on the topic of practical work Tasks of the SRS: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	Total workload: 180 hours. Lectures: 30 hours, practical: 30 hours, independent work of students: 120 hours.
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	Introduction to the specialty, biogeochemical monitoring, ecology of animals and plants
Course objectives/intended learning outcomes	Purpose: Land management, structure, features of geology, geodynamic processes, endogenous, exogenous, technogenic processes, formation of natural and anthropogenic systems, dynamics, etc. Know the features of the relief, structure, faults, the dynamic state of the Earth's surface, as well as expertise on practical necessity. Be able to: organize ecological and geological studies in order to assess and forecast the ecological situation for various economically developed territories, and natural and man-made objects. Skills -analysis of the environmental impact of the main functions of the lithosphere on the body and man, collection, processing and use of geological information.
Content of the course	The study of the structure of the Earth's crust, the features of geodynamic processes, endogenous, exogenous, technogenic processes, the formation of natural and anthropogenic systems, the dynamics of changes in geological processes, ways to prevent them. Analysis of the environmental impact of changes in the main functions of the lithosphere on the environment and humans, collection, processing and use of geological information.
Examination forms	During the academic semester, two intermediate examinations are conducted (the first after the seventh week of study and the second after the 15th week before the exam) to test students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	The exam in the discipline "Ecological Geology" is given orally. Firstly, in order to comprehensively test the knowledge of students, in-depth determination of their speech skills, the ability to express their thoughts, oral communication is necessary. Secondly, exam questions on a given discipline can be evaluated in the form of examples. Thirdly, only the oral method of the exam allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	Interactive whiteboard, projector, computer https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/
Reading list	1. Vasilyeva, M.Yu. Geoecological features of geospheres: a textbook / M.Yu. Vasiliev. Saratov: Nauka, 2011. 84 p. ISBN 978-5-9999-0981-7.

	2. Golubev, G.N. Fundamentals of Geoecology: textbook / G.N. Golubev. 2nd ed. Erased. Moscow: KnoRus, 2016. 352 p. 3. Koronovsky, N.V. Geology: textbook / N.V. Koronovsky, N.A. Yasmanov. 9th ed., erased. Moscow: Academy, 2014. 448 p.

Module 34

Course code and name	INEX 22026 Industrial Practice
Semester(s) when the course is taught	4
Person responsible for the module	Kobetaeva N.K -PhD, associate professor
Language	English
Within the curriculum (cycle, component)	Basic discipline (University component)
Teaching methods	Industrial practice is aimed at expanding and consolidation of theoretical and practical knowledge acquired by students in the course of training, acquisition and improvement of practical skills in the chosen educational program, preparation for future professional activities. Being the central link in the system of training of specialists, industrial practice helps students to understand better the correctness of their professional choice, to check the assimilation of theoretical knowledge received during the training, and to determine professionally important qualities of the future specialty. Using the unique capabilities of the organization allows to adapt the knowledge and skills of students to the conditions of specific industries already in the process of training.
Workload (incl. contact hours, self-study hours)	Practice-90
Credit points (total by discipline)	3 ECTS
Required and recommended prerequisites for joining the course	Fundamentals of biology, geography, chemistry, mathematics, physics, as well as the disciplines of bioecology, introduction to the specialty
Course objectives/intended learning outcomes	"Industrial practice" is a part of the basic educational program of the direction of personnel training. The aim of the industrial practice of the 3rd year is to consolidate the knowledge and skills obtained in the course of theoretical training in the framework of the curriculum of the specialty 5B060800-"Ecology", As well as to gain practical experience for solving production tasks required for further activities in the field of environmental protection. By the beginning of practice, the student should have an idea about basic laws and concepts of chemistry, general ecology, ecological safety, industrial ecology, ecology of industrial buildings and facilities, hydraulics and heat engineering, methods and devices for environment control, ecological monitoring and economic aspects of nature management. The student's tasks during the period of industrial practice of the 3rd year will prepare for studying disciplines in one or several directions: technical and technogenic risk reliability, ecological expertise, EIA and certification, water disposal and waste water treatment, inventory of atmospheric pollution sources, engineering methods of atmospheric protection, industrial waste disposal limits.
Content of the course	Intensification of economic and industrial activity of man in modern conditions of nature management and global scales of his anthropogenic impact on the main components of the biosphere create a situation of acute ecological crisis caused by degradation of environmental objects. In this regard, environmental impact management plays an important role in optimizing the conditions of interaction between man and nature. Students should know: - methods of assessing the impact on the natural environment; - methods of ecological monitoring of natural environment; - methods of scientific experiment in laboratory, field and industrial conditions
Examination forms	The exam is given in the oral form, that is, in the form of protection of the report. The form of intermediate control of the student intern on the results of all types of professional practice is differential credit (protection of the report at the

	meeting of the Commission of the graduating department). During the protection of the results of practice the student intern reports on its results, answers the questions, provides a package of documents on the results of professional practice and expresses the commission its own conclusions and suggestions.
Study and examination requirements	According to the results of the professional production practice the student provides reporting documentation to the department: practice diary-report (report at the discretion of the department). At the end of practice the student must demonstrate the acquired skills and experience. - filled-in internship report; - filled-in internship diary; - characteristic given by the head of practice; - completed individual assignment from the department (if any) Besides, the instructor develops criteria of knowledge, abilities and skills estimation. These criteria take into account specifics of the discipline. Assessment criteria are available to all students in the curriculum of the disciplines.
Technical and electronic learning tools	Computer, projector, interactive whiteboard
Reading list	1. Gorshkov M.V. Ecological monitoring. Moscow 2010, 425 pp. 2.Ashikhmina T.Y. Ecological monitoring. T.Ya. Ashikhmina.-M.: Academic project, 2019 .-- 416 p. 3. Vartanov, A.Z. Methods and instruments of control of the environment and environmental monitoring / A.Z. Vartanov, A.D. Ruban, V.L. Skinner. - Vologda: Infra-Engineering, 2016 .-- 640 p. 4. Kropotov Y. A., Proskuryakov A. Y., Belov A. A. Algorithms of automated systems of ecological monitoring of industrial production: a monograph 5. Bigaliev A.B., Khalilov M.F., Sharipova M.A. Fundamentals of general ecology Almaty, "Kazakh University", 2007. 6. Conservation of Biodiversity in Central Asia. Kazakhstan, Edited by T.M. Bragina, O.B. Pereladova. Almaty, 1997. 7. A.V. Chigarkin. Geoecology and Nature Conservation of Kazakhstan - Almaty: Kazakh University, 2003, - 338 p. 8. S.A. Pavlovitch, Somodel Collections on Botany, Moscow, 1961. 9. M. Kozlov, E. Nienburg, Your Collection, Gathering and Making Zoological Collections, Moscow, Prosveshchenie, 1971. 10. Emelyanov, A.G. Bases of nature management: textbook / A.G. Emelyanov. - 2nd ed. - Moscow: Academy, 2006. 304 p. 11. Fokin, Y. G. Theory and technology of training: activity approach: textbook for universities / Y. G. Fokin; ed. G. Fokin. - Moscow: Academy, 2006. Environmental expertise: textbook / V.K. Donchenko; ed. by V. M. Pitulko. M. Pitulko. - 2nd ed. ; stern. - Moscow: Academy, 2005.

Module 35

Course code and name	ECOL 32001 Soil ecology
Semester(s) when the course is taught	5
Person responsible for the module	Khussainov M., Tussupova Zh.,B.
Language	English
Within the curriculum (cycle, component)	Basic discipline (University component)
Teaching methods	Lecture: Multimedia lecture. Seminar assignments (practice): The use of interactive teaching methods, educational work in teams. Interactive method, differentiated approach, project method, lecture-conference, “hot chair” method, model method (real situation modelling). Independent work of the student: When implementing the plan of independent work, the student must read the theoretical material not only in textbooks and textbooks specified in the bibliographic lists, but also get acquainted with publications in periodicals. The student needs to creatively rework the material studied independently and provide it for the report in the form of an abstract and a summary of the topics

	of independent work. Verification of the implementation of the independent work plan is carried out in accordance with the schedule of submission of reports.
Workload (incl. contact hours, self-study hours)	lecture -15, Laboratory Classes -30, private study-105, total – 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Geology, mineralogy, geomorphology, geobotany, microbiology, hydrology, climatology, chemistry, physics.
Course objectives/intended learning outcomes	The purpose of the course: to form students fundamental knowledge about the biocontainment of the geographical envelope, modern theoretical foundations and methodological approaches of soil science, its applied aspects. As a result of studying this discipline, the student must: know-modern soil terminology, soil classification, factors and general scheme of soil formation, composition, properties, functions of soils. be able to assess soil properties in the field and laboratory conditions, use laboratory equipment. possess the skills of analyzing the general physical, chemical and physico-chemical properties of soils, cartographic work.
Content of the course	The course "Soil Ecology" lays the natural history foundation for environmental education. Mastering the basics of soil science develops the ability to further independently comprehend the complex and diverse material of modern ecology. Knowledge about the formation and genesis of soils, the patterns of their distribution contributes to a deeper disclosure of complex dialectical relationships in nature. Considering soils as natural-historical bodies that have emerged as a result of the interaction of natural and anthropogenic factors, the student gets a more complete understanding of the universal connection and interaction in nature and society. This is the special methodological role of Soil Ecology in the cycle of Earth sciences.
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam on the subject of Industrial ecology is taken orally. Because: First of all, in order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. Second, the third question of the exam questions of this discipline can be assessed in the form of calculations, and it can be assessed only by asking the meaning of oral formulas. Thirdly, I think that only the oral exam method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	Interactive whiteboard, projector, computer https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/
Reading list	Gennadiev A. N., Glazovskaya M. A. Geography of soils with the basics of soil science. - Moscow: Higher School of Economics – 2005. - 461 p. A classic university textbook. Dobrovolsky G. V., Nikitin E. D. Ecological functions of the soil: A textbook. - M.: MSU Publishing House, 1986. - 137 p. Soil Science. / I. C. Kauriev, N. P. L. Panov, N. N. Rozov, M. C. Strattonovich, A.D. Fokin. - Post. I. O. C. Kauricheva. - M.: Agropromiz-dat, 1989. - 719 P.

Module 36

Course code and name	ECOL 32002 Ecology of geosystems
Semester(s) when the course is taught	5

Person responsible for the module	Adilbektegi G. - Candidate of Geographical Sciences, Associate Professor of the Department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (University component)
Teaching methods	Lecture: Multimedia lecture. Questions and answers. Showing short videos on the topic of the lecture. For practical work, students perform tasks developed for each topic. SRO tasks: Each student prepares presentations on the topic, participates in debates.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Introduction to the specialty
Course objectives/intended learning outcomes	The purpose of the discipline: training of specialists with deep theoretical knowledge about the laws of spatial differentiation of natural and anthropogenic geographic systems. The course forms students' ideas about a single ecosphere, about the relationship of the atmosphere, hydrosphere, lithosphere and biosphere, taking into account the impact of human society on them. Tools for achieving the goal: independent work of students with a teacher, participation in practical seminars.
Content of the course	Ecology of geosystems is a complex scientific discipline that studies natural and natural-anthropogenic geosystems of a high hierarchical rank: landscape zones, physical and geographical countries, regions, provinces in order to protect nature. The essence of the geoecological approach is to assess possible changes in nature or their consequences from the standpoint of the need to ensure and maintain a healthy ecological environment within a certain geographical system.
Examination forms	The exam is conducted orally. Each exam ticket consists of three questions, the student is given 30 minutes to prepare.
Study and examination requirements	Midterm control 1 The student must pass 5 abstracts, write a control, participate in seminars, defend 1 presentation. Midterm control 2 The student must pass 4 essays, write a test, take part in seminars, defend 1 presentation. Outcome: The student is obliged to provide lecture notes, notes of self-study, pass an oral survey on the topics studied.
Technical and electronic learning tools	ERA program GIS methods Microsoft teams learning platform https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/
Reading list	1. Karlovich K.A. Geoecology. Textbook for high schools. - M.; 2005. 2. Rodzevich N.N. Geoecology and nature management. Textbook for high schools. - M., 2003. 3. Chigarkin V. Geoecology of Kazakhstan. - 2nd ed. arr. and add. - Almaty, 2006. - 412 p.

Module 37

Course code and name	ECOL 33001 Industrial ecology
Semester(s) when the course is taught	5
Person responsible for the module	Massenov Kairat Bagasharovich., candidate of technical sciences Professor
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (University component)

Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks**:** Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized. Case study, brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method, lecture-conference, “hot chair” method, model method (real situation modelling).
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Physics, chemistry, general ecology, soil, water; Competences in the field of atmospheric air ecology, general geology, mathematics. List of related disciplines: Ecological aspects of natural science; Engineering environmental protection; human ecology; Environmental modeling; Environmental audit; Environmental regulation and expertise, protection of natural resources, environmental safety and forecasting
Course objectives/intended learning outcomes	Introduce students to the basic concepts of the relationship between man and nature, the contradictions that arise in the course of material needs and the patterns of development of natural systems, the phenomena of natural resources and the peculiarities of their use. Explain the importance of scientific and technological progress. Explain the significance of the fourth industrial revolution. To teach how to use the knowledge gained in the course of training in practical, economic activities. To know about the relationship of mankind with natural systems, the resources of natural systems, the main pollutants of the environment, sources of production, environmental impact control, methods of greening production, the principles of greening, a comprehensive environmental analysis, legal norms for environmental protection.
Content of the course	In modern conditions of nature management, the intensification of human economic and industrial activities and the global scale of its anthropogenic impact on key components of the biosphere create a situation of acute ecological crisis caused by environmental degradation. In this regard, the role of environmental impact management is important to optimize the interaction of man with nature.
Examination forms	Orally
Study and examination requirements	The exam on the subject of Industrial ecology is taken orally. Because: First of all, in order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. Second, the third question of the exam questions of this discipline can be assessed in the form of calculations, and it can be assessed only by asking the meaning of oral formulas. Thirdly, I think that only the oral exam method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	Video lecture developed and hosted online courses on the ENU MOOC platform in the discipline Industrial Ecology "PE2303. Author: Massenov K.B. https://mooc.enu.kz/ https://mooc.enu.kz/course/view.php?id=237 Electronic textbook "Industrial Ecology" No. 2943 dated April 22, 2019. Author: Massenov K.B.

Reading list	1. Massenov K.B.; Abseitov E.T. Textbook "Industrial Ecology", 480 Art ISBN 9965-799-84-9 2018 (available in the library and at the department) 2. Massenov K.B.; Abseitov E.T. Monograph "Engineering environmental protection" VOL. No. 2, 263 pages. ISBN 978-601-238-540-3 2018 (available in the library and at the department) 3. Massenov KB; Abseitov E.T. Monograph A-17 "Industrial ecology", 398 pages ISBN 978-601-238-541-0.2018. (available in the library and at the department) 4. Massenov KB; Abseitov E.T. Industrial Ecology Textbook 480 pages ISBN 9965-799-84-9 2018 (available in the library and at the department) 5. Massenov KB; E. Abseitov; Aitlesov K. Onu Araly "Onerkusiptik ecology", 207 pp.ISBN 978-601-206-064-5 2018 lived (available in the library and at the department) 6. I. I. Mazur, O. I. Moldavanov Course of Engineering Ecology. Moscow "Higher School" 2001. (available in the library) 7. A. G. Vetoshkin. Theoretical foundations of environmental protection: Textbook. manual / M .: Higher school., 2008 - 397s.; silt (available in the library) https://www.microsoft.com/ https://www.socrative.com/

Module 38

Course code and name	ECOL 33002 Urboecology
Semester(s) when the course is taught	5
Person responsible for the module	ZhantokovB.ZH., senior lecturerof the department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized. Brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method, lecture-conference, “hot chair” method, model method (real situation modelling).
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Bioecology,Ecological aspects of natural science, Ecological biogeography
Course objectives/intended learning outcomes	Knowlege: the basic principles of environmental protection from pollution, methods of monitoring the state of the environment, the importance of environmental factors and the sanitary and hygienic role of green spaces. Be able to: apply monitoring methods to monitor the state of green spaces, taking into account environmental factors in the city, select an assortment of plants for a particular object. Possess: methods of monitoring the urban environment, the ability to make recommendations aimed at preserving the environmental functions of plantings.

Content of the course	The discipline "Urboecology" helps students to master the basic concepts and principles of the ecology of cities and settlements, knowledge about the interaction of environmental factors in the urban environment, about the formation of the urban environment, familiarizing them with modern urban planning proposals aimed at protecting the health of the population of cities, problems of maintaining the balance and stability of the urban environment. The discipline also introduces students to monitoring the state of the urban environment and monitoring the state of green spaces.
Examination forms	The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam on the subject of Urboecology is taken orally. Because: In order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. In addition, I think that only the oral examination method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	Multimedia projector, computer, interactive whiteboard https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/
Reading list	Ruchin A. B., Meshcheryakov V. V., Spiridonov S.N. Urban ecology for biologists. - Moscow: KolosS, 2009 Tetior A. N. Urban ecology. - M.: Publishing Center "Academy", 2007. Filin V. A. Ecology of the visual environment of the city/V. A. Filin // Ecology and life. – 2007

Module 39

Course code and name	ECOL 33003 Population ecology and biocenology
Semester(s) when the course is taught	3
Person responsible for the module	Saspugaeva G.E. - associate professor, Adilbektegi G.A. - associate professor, Daribai Ainur - senior lecturer
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Oral explanation. Communicative method, 6-hat method, cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (modeling of a real situation). Workshop tasks (practice): Divide the group into several subgroups. Each subgroup is prepared individually, and each subgroup makes its own calculation on the topic of practical work Tasks of the SRS: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Bioecology, Social ecology, Ecology of plants and animals

Course objectives/intended learning outcomes	Objectives: The purpose of understanding regional and global environmental problems related to the study of ecological patterns of interaction of living organisms with each other and with the environment. The course includes questions about the numerous and complex internal relationships of the biocenosis as a structural unit of wildlife that has certain limits of stability; dynamics of demographic processes (birth and death rates, sex and age structure, population dynamics, etc.); To know: basic concepts and ideas about the role of population and biocenosis in the biosphere Have skills: apply knowledge consideration of modifying and regulating factors affecting the quantitative side of the population. Competencies: to give students an idea of the structure of species in the population, their static and dynamic indicators
Content of the course	To give an idea of the structure of species in a population, their static and dynamic characteristics, to take into account biotic factors between them, population changes in close connection with the action of a combination of biotic and abiotic environmental factors. During the academic semester, two intermediate tests are conducted (the first after the seventh week of study and the second after the fifteenth week before the exam) for the oral examination of students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket consists of three questions, and the student is given 30 minutes to prepare.
Examination forms	During the academic semester, two intermediate tests are conducted (the first after the seventh week of study and the second after the fifteenth week before the exam) for the oral examination of students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket consists of three questions, and the student is given 30 minutes to prepare.
Study and examination requirements	Verification of the results of training in a specific discipline of the educational program is carried out by passing an exam. The forms of the exam are determined by the teacher or the lead teacher. The forms of exams can be oral, written, combined, computer testing or matrix testing. The teacher-teacher for practical classes develops a set of theoretical questions covering the content of the entire course, and practical tasks to determine the formation of skills and abilities. First of all, for the purpose of a comprehensive examination of students' knowledge, a deep definition of their speaking skills, the ability to express their thoughts, only oral communication is determined. Secondly, the third question of the examination questions in this discipline can be evaluated in the form of calculations, and it can be evaluated only by asking the meaning of oral formulas. Thirdly, I believe that only the oral exam method allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	Projector, computer https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/ THE ERA of the program Google (Google Glass/ Google Forms)

Reading list	1. Ruchin A.B. Ecology of populations and communities. Textbook. M.; Academy Center, 2006. 2. Gilyarov M.S. Species, populations and biocenoses. Russia, St. Petersburg; Russian Ornithological Journal, 2015 3. A.Zh. Akbasova, Sainova G. "Ecology" Almaty 2010. 4. Kenesariev Yu.I. Ecology and public health, 2011. 5. McMillan K., Komar J. Ecology of the population (organizational ecology): an experimental exercise demonstrating how organizations in the industry are born, change and die., 2018. 6. Egerton F.N., Mayer G.K. Ecology of animal populations, 2018.

Module 40

Course code and name	ECOL 33004 Methods of geoecological researches
Semester(s) when the course is taught	5
Person responsible for the module	Zhumabaeva Saule
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks: prepares each subgroup of scientific discoveries on the topic; videos, presentations. Debates will also be organized and discussed.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Bioecology, Social ecology, Ecology of plants and animals
Course objectives/intended learning outcomes	identification of changes in the life support of geospheric shells under the influence of natural and anthropogenic factors, preservation of a productive natural environment for present and future generations of mankind.
Content of the course	assessment of the state of natural resources and geosystems, forecasting their qualitative and quantitative changes, analysis of the impact of the economy on the environment, improvement of the state of nature management and the environment, as well as practical necessity.
Examination forms	Orally
Study and examination requirements	The exam in the discipline "Geoecological research methods" is given orally. Firstly, a comprehensive examination of students' knowledge and in-depth determination of their communication skills, the ability to express their thoughts are determined only by an oral exam. Secondly, the third question of the examination tickets for this discipline is given for research, profiling. Thirdly, I believe that only the oral exam method allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	Discipline methods of geoecological research in the process of teaching students, video lecture materials prepared by the author, as well as an interactive whiteboard, multimedia technical means are used
Reading list	Ryazanova N.E. Methods of environmental research 2019. Gagina N.V. Methods of geoecological research. Minsk, 2015. Tregubov O. V.; Popikov V. P.; Akhtyrtsev A. B. Landscape studies. VSUFT, 2017 https://www.twirpx.com/

Module 41

Course code and name	ECOL 33005 Macroecosystem Ecology
Semester(s) when the course is taught	5
Person responsible for the module	Kapsalyamov B. doctor of technical sciences, professor of the department/ SaspugayevaG.Y-PhD, associate professor/SamatovaI.S.-senior teacher, Zhumabayeva S.D.-senior teacher
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers. Case study, brainstorming, works in group, communicative method, method of 6 hats. Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks:Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Social ecology, Environmental studies, Evolution of the biosphere, Biogeochemical provinces
Course objectives/intended learning outcomes	Macroecosystem Ecology" is a discipline that study broad specter of modern environmental problems of the Earth. The course gives an idea of the laws in natural systems, the relationship between the organism and their environment, role of human activity in some global problems of environment. Aims of discipline:discipline focused on the description and explanation forgraduates scientific information on the general principles of the formation of modern environmental problems, its methods and areas of work and the basics of assessing the quality of the various components of the environment. Tasks of the discipline: -Basic concept of modern environmental problems; -Examine and understand the current methods of studying the ecology, legal regulations governing the quality of the environment; -Help undergraduates based on modern technology to master the methods of independent research and analysis in the field of modern environmental problems, the use of it in the process of scientific and practical activities of a student
Content of the course	The course deepens the knowledge of modern environmental problems graduate of the general laws of adverse effects of the environment on the human body, reveals the complex mechanisms of environmentally -driven changes in health, and contributes to a master's degree in basic knowledge for the development of a set of measures to minimize the impact of climate change on humans.
Examination forms	The exam is taken orally, that is, in the form of an examination ticket. The exam tickets consist of 25 options. Each ticket consists of 3 questions. The exam questions cover all the material passed in 1 semester of full training at the lecture and practical lesson.

Study and examination requirements	Checking the learning outcomes in a specific discipline of the educational program is carried out by taking an exam. The forms of exam is determined by the lecturer or leading teacher. The forms of the exams can be oral, written, combined, computer testing or matrix testing. A lecturer and a teacher for practical training develops a set of theoretical questions covering the content of the entire course, and practical tasks to determine the formation of skills and abilities. Depending on the form of exams the lecturer prepares the examination materials which include exam tickets (where at least two questions are included) or tests. Examination tickets are revealed only on the day of exam, though the students are given the list of approximate questions beforehand to get ready for exams. The questions cover all taught material. The exam tickets may consist of at least one theoretical question and one practical (applied). Usually one discipline demands 25 examination tickets. Tests are prepared according to the taught material and are huger in amount. They can also include theoretical and practical questions; they can have answer options or demand fulfilling the gaps. In addition, the lecturer develops criteria for assessing knowledge, skills and abilities. These criteria take into account the specifics of the discipline. The assessment criteria are available to all students in the syllabus of the disciplines.
Technical and electronic learning tools	Multimedia projector, computer, interactive whiteboard Google (Google Class/ GoogleForms)
Reading list	1. Bogolyubov, Sergei Alexandrovich Actual problems of environmental law. GrifUMO of universities of Russia / Bogolyubov Sergey Alexandrovich. - M.: Yurayt, 2015.- 877 p. 2. Bulatov, Ramil Global environmental problems, society and economy / RamilBulatov. - M.: Publishing solutions, 2012. - 600 p. 3. Visual material. Environmental problems of the world / Great geographical discoveries. - M.: Bustard, 2015.- 788 p. 4. Burko R.A. Environmental problems of modern society and their solutions / R.A. Burko, T.V. Tereshina//Young Scientist. - 2013. - No. 11. - S.237-238. 5. VoloshchenkoA.E., GuskovG.V. Nature management. - M.: Dashkovi K, 2013.- 310 p. 6. VinokurovaD.V. Environmental pollution control system. - N. Novgorod: 2011. - p. 56 7. GolubA.A., StrukovaE.B. Natural resource economics. - M.: Aspen - Press, 2011.-319 p.

Module 42

Course code and name	ECOL 33006 Ecology of aquatic ecosystems
Semester(s) when the course is taught	3
Person responsible for the module	Akbaeva Lyailya, candidate of biological sciences, professor of the department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Case study, brainstorming, group work, communicative method, 6 hats method, syncwine method, interactive method, differentiated approach, project method, lecture-conference, hot chair method, model method (simulation of a real situation). Lecture: Multimedia lecture. oral explanation. Questions and answers, Showing short videos on the topic of the lecture Workshop tasks (practice): Divide the group into several subgroups. Each subgroup prepares individually and each subgroup makes its own calculation on the topic of practical work Tasks of the CDS: Each subgroup prepares scientific news on the topic for the last 3 years; videos will be organized on the topic of practical work, presentations and debates on the topic

Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Social ecology, Environmental studies, Evolution of the biosphere, Biogeochemical provinces
Course objectives/intended learning outcomes	Existing competencies in soil ecology, methods of geoecological research, urban ecology. List of related disciplines: chemistry, environmental physics, human ecology, social ecology, plant ecology
Content of the course	Purpose: To give students knowledge and teach them to make practical decisions about the physicochemical and biological properties of water, hydrobionts, channel processes, the role of hydrobionts in the processes of water self-purification, the integrated use of water resources in the economy, the negative impacts of natural and anthropogenic nature on hydroecosystems, the introduction of environmentally friendly technologies
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) for oral testing of students' knowledge. Time for intermediate control 50 minutes. The exam is conducted orally. Each exam ticket consists of three questions and the student is given 30 minutes to prepare.
Study and examination requirements	The exam on the subject of Industrial Ecology is taken orally. Since: first of all, in order to comprehensively test the knowledge of students, to deeply determine their speaking skills, the ability to express their thoughts, only oral communication is determined. Secondly, the third question of the examination questions in this discipline can be evaluated in the form of calculations, and it can be evaluated only by giving the meaning of oral formulas. Thirdly, I believe that only the oral examination method allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	MS Teams, MOOC, MOODLE on the ENU website, the use of multimedia boards in the classroom
Reading list	1. Bestuzheva A.S. General hydroecology MISS - MGSU, 2015 2. Loginova, E.V.; Burdock P.S. Hydroecology. M., 2014. 3. Makarevich T. A.; Kamlyuk L.V. Hydroecology, Moscow, 2014 https://edpuzzle.com/ https://whiteboard.fi/

Module 43

Course code and name	ECOL 33007 Protection of natural resources
Semester(s) when the course is taught	5
Person responsible for the module	Kobetayeva N. K.
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Informational or problem lecture Tasks of the seminar (practice): A seminar in the form of a conference, debate, oral interview Tasks of the IWS: performing tasks on the topic of the lecture: abstracts, watching videos, reading special literature. Cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (simulation of a real situation).
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS

Required and recommended prerequisites for joining the course	Available competencies in the field of ecology, environmental toxicology, biogeochemical monitoring, ecology of animals and plants. List of related disciplines: chemistry, environmental physics, human ecology, social ecology, plant ecology
Course objectives/intended learning outcomes	Tasks: to identify possible ways to preserve and restore natural resources; to know the principles of safe environmental management. The course includes: a scientific complex of measures for the conservation, rational use and restoration of natural resources and the natural environment, the richness of the subsoil, the purity of waters, forests and the atmosphere of the Globe. Knowledge: Students know about environmental resources, their classification, rational use of resources and protection of natural resources. Skills: Nature protection has economic, historical, social and state significance, the use of environmental measures; resources of economic, historical, social and state significance
Content of the course	The course is a necessary subject in the training of future specialists. It allows students to study the basic concepts of the relationship between man and nature, the basic principles of urban industry and urbanization, the real connection between the development of technique and technology.
Examination forms	During the academic semester, two intermediate tests are conducted (the first after the seventh week of study and the second after the fifteenth week before the exam) for the oral examination of students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket consists of three questions, and the student is given 30 minutes to prepare.
Study and examination requirements	The exam on the subject is taken orally. Since: First of all, for the purpose of a comprehensive examination of students' knowledge, a deep definition of their speaking skills, the ability to express their thoughts, only oral communication is determined. Secondly, the third question of the examination questions in this discipline can be evaluated in the form of calculations, and it can only be evaluated by asking the meaning of oral formulas. Thirdly, I believe that only the oral exam method allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	Interactive whiteboard, multimedia equipment, electronic library. https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/
Reading list	1. Kolesnikov S.I. Ecological foundations of nature management, Moscow, 2012. 2. Kuatbaev A.T. Ecology and environmental problems. 2017. Almaty

Module 44

Course code and name	ECOL 33008 Rational use of natural resources
Semester(s) when the course is taught	5
Person responsible for the module	Massenov Kairat Bagasharovich., candidate of technical sciences Professor
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)

Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized. Case study, brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (real situation modelling).
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Geology, microbiology, botany, geology, soil science, landscape List of related disciplines: Engineering environmental protection; human ecology; Environmental modeling; Environmental audit; Environmental regulation and expertise, protection of natural resources
Course objectives/intended learning outcomes	The study of the current state, methods, techniques and technologies for their restoration and protection in the process of development and use of land resources. - formation of an idea of land resources as a natural object; - to form ideas about the existing options for pollution and degradation of land resources and their consequences during the construction and operation of industrial facilities; - consideration of the main directions of rehabilitation of degraded lands and requirements for their implementation; - study of equipment and technology of work during the reclamation of the mountain period; - to study the ecological foundations of the biological stage of the restoration of industrial lands.
Content of the course	Theoretical foundations for the rational use of land resources Functional role of soil in natural and artificial ecosystems. General features of land use Environmental aspects of the impact of industrial production on land resources Agricultural production and its impact on the state of land resources. Chemicalization of agricultural production and the environment. Ecological problems of agricultural mechanization. Socio-economic systems and their impact on land use Agrochemical monitoring Information support for the rational use of land resources The current state of the land fund of the Republic of Kazakhstan Theoretical foundations for the environmental sustainability of land use and land use Environmental and economic issues Rational use of land. Ameliorative works Alternative land use systems and their ecological significance.
Examination forms	Orally

Study and examination requirements	The exam on the subject of Industrial ecology is taken orally. Because: First of all, in order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. Second, the third question of the exam questions of this discipline can be assessed in the form of calculations, and it can be assessed only by asking the meaning of oral formulas. Thirdly, I think that only the oral exam method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	In the process of teaching students the subject of environmental management, electronic textbooks, video lectures prepared by the author, as well as interactive whiteboards, multimedia technical means are used.
Reading list	1. Chelnokov A. A. Environmental protection and energy saving: textbook . /A. A. Chelnokov, L. F. Yushchenko. - Kokshetau: Keleshek-2030, 2013-442 p. 2. Romanova, E. P. Natural resources of the world [Electronic resource]: textbook / E. P. Romanova, L. I. Kurakova, Yu. G. Ermakov.- 3, 72MB. - Moscow: MSU Publishing House, 1993. - 304 p. 3. Golovanov A. I.: Land recultivation. - M.: "Kolos", 2009. Chernikov V. A. et al. Agroecology. - M., "Kolos", 2000. 4. N.I. Bebrezovski Natural resource and its use. – Minsk: BNTU, 2005. – p.115-146, 158-183; 5. Watt K., Ecology and natural resource management. – M., 1991; 6. Friedman, Yali (2008) Building Biotechnology: Starting, Managing and Understanding Biotechnology. Washington, DC: Logos Press. ISBN 978-0-9734676-3-5. 7. Hulse, J. (2007). Sustainable Development at Risk. Ignoring the Past OttawaFoundationBooks/IDRC; 8. Hopwood, B., Mellor, M. and O'Brien, G. (2005). Sustainable Development: Mapping Different Approaches. Sustainable Development13,38–52. Microsoft teams https://www.microsoft.com/ https://www.socrative.com/

Module 45

Course code and name	ECOL 32003 Ecological monitoring
Semester(s) when the course is taught	6
Person responsible for the module	Saspugaeva G.E.-associate professor, Zandybai A.-associate professor
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. A video lecture developed by the author of the discipline. Questions and answers. Group work, communicative method, 6 hat method, cinquain method Showing short videos on the topic of the lecture. Workshop tasks (practice): The group is divided into several subgroups. Each subgroup is prepared individually, each subgroup makes its own calculation on the topic of practical work. Tasks of the IWS: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations and debates on the topic will be organized. Presentation for each lesson using a computer, projector, interactive whiteboard
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS

Required and recommended prerequisites for joining the course	Available competencies in the field of ecology, environmental toxicology, biogeochemical monitoring, ecology of animals and plants. List of related disciplines: chemistry, environmental physics, human ecology, social ecology, plant ecology
Course objectives/intended learning outcomes	To obtain basic knowledge about the laws of ecosystem functioning, to apply knowledge for the organization of environmental monitoring, to choose effective solutions based on the assessment of observations. Formation of skills and abilities: studying the system of observation and ground support methods and characteristics of feedback and management in the environmental monitoring system; studying control methods; familiarization with biomonitoring in environmental quality assessment; acquiring knowledge about monitoring the state of water resources; atmospheric air, soil and biological resources.
Content of the course	«Environmental monitoring» - is a discipline about natural fluctuations and changes in the state of the environment among students, which will allow: 1) assess the indicators of the state of functional integrity of ecosystems and human habitat; 2) identify the reasons for changes in these indicators and assess the consequences of such changes, as well as identify corrective measures in cases where environmental targets are not achieved; 3) create prerequisites for determining measures to correct emerging negative situations before causing damage. Students should know: - the purpose of observing the natural environment, methods of observing and analyzing the state of ecosystems; - causes of changes in the species composition of flora and fauna under the influence of human activity; - mechanisms for ensuring the sustainability of ecosystems; - the main groups of pollutants, the ways of their migration, transformation and accumulation in ecosystems. be able to: - use methods of detection and quantification of major pollutants in the environment; - apply the basic methods of mathematical modeling and computer methods of analyzing the state of ecosystems; - to use a systematic approach when setting tasks for studying biospheric processes.
Examination forms	The exam is taken orally by the student.

Study and examination requirements	The intensification of human economic and industrial activity in modern environmental management conditions and the global scale of its anthropogenic impact on the main components of the biosphere create a situation of acute ecological crisis caused by the degradation of environmental objects. In this regard, the role of environmental impact management is important for optimizing the conditions of human interaction with nature. Students must own: - methods of environmental impact assessment; - methods of environmental monitoring of the natural environment; - methods of scientific experiment in laboratory, field and production conditions. The exam is given orally, that is, in the form of an examination ticket. Exam tickets consist of 25 options. Each ticket consists of 3 questions. Exam questions cover all the material passed during 1 semester of full training in a lecture and practical lesson. Taking oral exams of students in the form of examination tickets, we can fully test their knowledge: knowledge about the main functional ecological units: individual species, populations, biogeocenoses, ecosystems; master the problems of natural resources and their effective use - form theoretical knowledge about the biosphere - the global ecosystem; perfectly assess how much they have learned the accent based on knowledge about modern environmental problems and their development.
Technical and electronic learning tools	Interactive whiteboard, multimedia equipment, electronic library. https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/
Reading list	1. Gorshkov M. V. Environmental monitoring. Moscow 2010, 425 pages 2. Ashikhmina, T. Y. Environmental monitoring. T.Y. Ashikhmina. - M.: Academic Project, 2009. - 416 p. 3. Vartanov, A.Z. Methods and devices of environmental control and environmental monitoring / A.Z. Vartanov, A.D. Ruban, V.L. Shkuratnik. -Vologda: Infra-Engineering, 2010.- 640c. 4. Kropotov Y. A., Proskuryakov A. Y., Belov A. A. Algorithms of automated systems for environmental monitoring of industrial production: monograph 5. Latyshenko, K.P. Environmental monitoring: Textbook and workshop for applied bachelor's degree / K.P. Latyshenko. - Lyubertsy: Yurayt, 2016. - 375 p. Additional literature 6. Sharova, N.I. Environmental monitoring of the technosphere: A textbook / N.I. Sharova. - St. Petersburg: Lan, 2014. - 368 p. 7. Tikhonova, I.O. Ecological monitoring of the atmosphere: A textbook / I.O. Tikhonova, V.V. Tarasov, N.E. Kruchinina. - M.: Forum, SIC INFRA-M, 2013. - 136 p. Additional sources: The programme of ERA GIS methods

Module 46

Course code and name	ECOL 33009 Habitat and human ecology
Semester(s) when the course is taught	6
Person responsible for the module	Massenov Kairat. candidate of technical sciences, professor of the department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)

Teaching methods	Lecture: Multimedia lecture. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized. Case study, brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (real situation modelling).
Workload (incl. contact hours, self-study hours)	lecture - 15, seminar - 30, private study - 105, total - 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Existing competences in basics of biology, ecology and sustainable development, geoecology, chemistry, mathematics, physics, soil science and the basics of life safety is necessary.
Course objectives/intended learning outcomes	Objectives: the acquisition of specific ideas about the environment, the study of the human-nature system and society, the formation of a system of knowledge about the interaction of man and the environment in the universe. Know - theoretical foundations of life safety, the human-environment system, the composition of the environment, the structural diagram of the interaction of a person in a modern industrial society with the biosphere, technosphere and social environment, the theory of nature management and environmental and legal regimes for the use of resources Be able to know exchange of flows of matter and energy, social environment, information; about the problems of the relationship between nature and society; on the forms, scope and significance of environmental protection, human interaction of the environment and natural resources. Have skills – to use the knowledge gained about the laws of human interaction with the environment in practical activities to preserve sustainable development
Content of the course	Habitat - all bodies and phenomena with which the organism is in direct or indirect relationship. The habitat directly or indirectly affects the state, development and reproduction of individual organisms and populations. Distinguish between abiotic, biotic and anthropogenic habitats
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam on the subject of Habitat and human ecology is taken orally. Because: In order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. In addition, I think that only the oral examination method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	MS Teams, MOOC, MOODLE on the ENU website, the use of multimedia boards in the classroom

Reading list	1. Akimov V.A., Lesnykh V.V., Radaev N.N. Risks in nature, the technosphere, society and the economy. - M.: Business Express, 2004. - 352 p 2. Bigaliev A. B., Khalilov M.F., Sharipova M.A. "Basics of General Ecology", - Almaty, "Kazakh University", 2007. 3. Aytkazin M.A. Life Safety. - Almaty, 2003. 4. Life Safety: Proc. for universities. / Ed. S.V. Belova; 5th ed., Rev. and add. - M .: Higher. school., 2005.- 606 p. 5. Reimers N. F. Hopes for the survival of mankind. Conceptual ecology. M., ITS "Young Russia", 1992 6. Life Safety: Proc. for medium prof. studies./About. Ed.C.V. Belova; 5th ed., Isp. And add. - M.: Higher. sh., 2006. - 424 p. 92. 7. Prikhodko N.G. Life Safety: Course of lectures. - Almaty: HSP "Adilet", 2000. 8. "Biological Encyclopedic Dictionary." Ch. ed. M. S. Gilyarov; Edited .: A. A. Babaev, G. G. Vinberg, G. A. Zavarzin and others - 2nd ed., Amended. - M .: Owls. Encyclopedia, 1986 (Available in the university library) Microsoft teams

Module 47

Course code and name	ECOL 33010 Institutional support of environmental protection
Semester(s) when the course is taught	6
Person responsible for the module	Massenov Kairat. candidate of technical sciences, professor of the department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Cinquain method, interactive method, differentiated approach, project method, lecture-conference, "hot chair" method, model method (real situation modelling). Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, self-study-105, total – 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Existing competences in "Social Ecology and Sustainable Development", "Environmental Impact Assessment", "Environmental Monitoring"
Course objectives/intended learning outcomes	Objectives - the aggravation of the ecological situation in the world in the middle of the twentieth century brought the ecology out of the subject of studying a limited circle of biologists and placed it among the most important modern sciences Know - theoretical and practical training of students in the legal framework of environmental management and marketing Be able to know of environmental legislation, studying the mechanism of its application; Have skills - mastering the theoretical and practical skills of its application in life
Content of the course	From its general ecology, its most important part is singled out - social ecology, which studies the conditions and patterns of interaction between society and the environment. In the social ecology, legal ecology is an integral part. Public relations in the sphere of interaction between society and nature are regulated by a complex of branches of law.

Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam on the subject of Institutional support of environmental protection is taken orally. Because: In order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. In addition, I think that only the oral examination method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	https://elar.urfu.ru › bitstream
Reading list	1. Baideldinov DL Bekisheva S.D. Ecological Law of the Republic of Kazakhstan: Textbook of Alterations: Interleague, 2004 (available in the library) 2. Kushumbaev AA Ecological Law of the Republic of Kazakhstan: Textbook for Universities Astana: Foliant, 2001 330 p. (available in the library) 3. Kulteleev S.T. Workshop on Environmental Law of the Republic of Kazakhstan Almaty: Daneker, 2001.106 p. (available in the library) 4. Koshkarov N. B., Abseitov E. T., Massenov K. B. Textbook «Basics of ecological rationing and expertise» ISBN 9965-799-45-8, 128 p. Almaty- 2018. TOO Nur-Print (available in the library and at the department) 5. Akhmedzhanova GB, Shaldybaev Zh. A., Kadysov S. Sh. Ecological Law of the Republic of Kazakhstan: educational and methodological benefits .- Pavlodar: Kereku. 2009 (available in the library) Google (Google Class/ GoogleForms)

Module 48

Course code and name	ECOL 33011 Waste management
Semester(s) when the course is taught	6
Person responsible for the module	Akbayeva Lyailya, Candidate of Biological Sciences, Professor of the Department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Case study, brainstorming, group work, communicative method, 6 hat method, cinquain method, interactive method, differentiated approach, project method, lecture-conference, «hot chair» method, model method (simulation of a real situation). Informational or problem lecture with the calculation of tasks Workshop tasks (practice): Divide the group into several subgroups. Each subgroup is prepared individually Tasks of the IWS: performing tasks on the topic of the lecture: abstracts, watching videos, reading special literature.
Workload (incl. contact hours, self-study hours)	Total workload: 180 hours. Lectures: 30 hours, practical: 30 hours, independent work of students: 120 hours.
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, it is necessary to know the basics of biology, geography, chemistry, physics, as well as related disciplines. Introduction to the specialty, Protection of natural resources.

Course objectives/intended learning outcomes	Objective: to know about the activities of domestic and foreign sectors of the economy in the field of waste management, waste minimization; to assess global and regional risks to ecosystems associated with waste. The course gives an idea of the processes of formation and movement of waste in the «natural environment-man» system, production and consumption waste. Knowledge of environmental emissions and their features, consequences, problems and decontamination technology and policy. Tools for achieving the goal: motivation of students to research activities, independent work of students with a teacher.
Content of the course	The course includes the following issues: measures for the collection, transportation, processing, disposal or disposal of waste, as well as control over these processes. At the same time, waste is usually understood as those wastes that arise as a result of human activity. This management system is aimed at reducing the harmful effects of waste on human health, on the environment, for economic reasons due to the possibility of recycling most of the waste, as well as for aesthetic reasons.
Examination forms	During the academic semester , two intermediate controls are carried out (the first after the seventh week of study and the second after the fifteenth week before the exam) for an oral examination of students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket consists of three questions, and the student is given 30 minutes to prepare. Oral exam. The assessment of knowledge in the discipline provides for the formulation of additional questions, to which the student gives oral explanations in the conversation.
Study and examination requirements	Midterm assessment 1 - Student must pass 5 essays, write a test, participate in seminars, defend 1 presentation. Midterm assessment 2 - The student must pass 4 essays, write a test paper, take part in seminars, defend 1 presentation. The result: The student is obliged to provide lecture notes, notes of independent studies, to take an oral survey on the topics studied. The student must demonstrate theoretical knowledge of waste management at all stages of the process. Be able to solve the tasks of collecting, transporting, recycling and disposal and recycling of waste. Mandatory attendance of classroom classes, active participation in discussion of issues, preliminary preparation for lectures and seminars on teaching aids and basic literature, high-quality and timely performance of tasks of the IWS, participation in all types of control (current control, IWS control, boundary control, final control).
Technical and electronic learning tools	Interactive whiteboard, multimedia equipment, electronic library/ https://kahoot.com/ https://www.microsoft.com/
Reading list	Environmental protection from production and consumption waste: textbook for universities. 2017, 230c. Smirnov S., Bushuev N. Methods for determining the toxicity classes of production and consumption waste. N.E. Bauman, 2020, 98c. Ryazantseva A., Lukashina G. Passport of waste hazard. Determination of the hazard class of waste. MGIU, 2018. 124 S. Y.S. Drugov Analysis of contaminated soil and hazardous waste: a practical guide. 2018/

Module 49

Course code and name	ECOL 33012 Ecologycal resource science
Semester(s) when the course is taught	6
Person responsible for the module	Khussainov M., Zhumabayeva S.D.
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)

Teaching methods	Lecture: Multimedia lecture. Seminar assignments (practice): The use of interactive teaching methods, educational work in teams. Case study, brainstorming. Independent work of the student: When implementing the plan of independent work, the student must read the theoretical material not only in textbooks and textbooks specified in the bibliographic lists, but also get acquainted with publications in periodicals. The student needs to creatively rework the material studied independently and provide it for the report in the form of an abstract and a summary of the topics of independent work. Verification of the implementation of the independent work plan is carried out in accordance with the schedule of submission of reports.
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total - 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Geology, social ecology, methods of geoecological research, soil ecology.
Course objectives/intended learning outcomes	Purpose: Knowledge of the principles of ecological analysis of natural resources, identification of ways of reproduction, conservation and conservation of natural resources. Know– be able to navigate the trends in the development of the ecological and economic system; - use of complete and incomplete information on environmental responsibility; - planning of changes in the modern environmental safety management system; - ability to see contradictions and establish connections between phenomena; - solving complex multi-faceted tasks; Be able to:- environmental analysis and monitoring; - in the analysis of the dynamics of environmental processes associated with anthropogenic impact and natural disasters; - on the conditions of the organization and the process of accumulation of environmental funds; Availability of skills – conducting an environmental assessment of certain types of natural resources and their complexes and analyzing their consequences, issues of their protection, effective use and resource supply; creating an assessment of environmental and economic problems and setting problems, developing technologies for resource protection and resource extraction; Making management decisions in the normal functioning of the ecosystem of the Republic of Kazakhstan and issues of conservation of natural resources;
Content of the course	1. Consider existing approaches to the study and assessment of natural resources. 2. To study the classification of natural resources on various grounds. 3. To consider different categories of natural resources (land, water, mineral resources, etc.), to assess their volumes, to analyze patterns of distribution, dynamics of consumption, problems of use and protection of natural resources. 4. Explore different approaches to assessing the natural resource potential of the territory. 5. Consider the environmental and legal regimes of resource use (land use, subsurface use, water use).
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare

Study and examination requirements	The exam on the subject of Industrial ecology is taken orally. Because: First of all, in order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. Second, the third question of the exam questions of this discipline can be assessed in the form of calculations, and it can be assessed only by asking the meaning of oral formulas. Thirdly, I think that only the oral exam method allows you to fully assess the knowledge of studen ts (for example, to ask additional questions).
Technical and electronic learning tools	ENU website systems: MOOC, MOODLE, MSTeams; using a multimedia whiteboard during classes https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/
Reading list	Ivanov Evgeny Sergeevich, Kochurov Boris Ivanovich. Ecological Resource Studies 2015 S. A. Bakhbaeva, A. M. Rakhmetova. Environmental Resource Studies. 2016 Chigarkin, A.V. Ecological resource: educational resource/A.V. Chigarkin- Almaty: Kazakh University, 2004. - 239 P.

Module 50

Course code and name	ECOL 33013 Environmental regulation and examination
Semester(s) when the course is taught	6
Person responsible for the module	Massenov Kairat. candidate of technical sciences, professor of the department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): interactive method, differentiated approach, project method, lecture-conference, “hot chair” method, model method (real situation modelling). SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total - 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Existing competences in: "Environmental Audit", "Environmental Impact Assessment", "Environmental Monitoring"
Course objectives/intended learning outcomes	Objectives: Within the course, significant attention is paid to the study of the fundamentals of environmental management in the Republic of Kazakhstan. Know - to provide students with general theoretical knowledge of the existing legal, regulatory and institutional framework for environmental regulation and environmental impact assessment in Kazakhstan and other countries of the world. Be able to present the current state and trends in the development of scientific and applied knowledge in this area, to professionally prepare students for conscious and effective participation in the procedures for rationing of environmental management and environmental impact assessment Have skills - to have skills to organize and ensure the implementation of state policy to limit the negative impact on the biosphere.

Content of the course	When studying the legislative and regulatory framework in the field of environmental regulation and expertise in the Republic of Kazakhstan, as well as procedures of environmental regulation and expertise, international aspects of the development of environmental regulation and environmental assessment, EU directives are also considered. The study of the procedures of environmental regulation and examination takes place using practical examples of the planned economic and other activities in Kazakhstan.
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam on the subject of Environmental regulation and examination is taken orally. Because: In order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. In addition, I think that only the oral examination method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	ENU website systems: MOOC, MOODLE, MSTeams; using a multimedia whiteboard during classes https://edpuzzle.com/ https://whiteboard.fi/
Reading list	1. Koshkarov N. B., Abseitov E. T., Massenov K. B. Textbook «Basics of ecological rationing and expertise» ISBN 9965-799-45-8, 128 p. Almaty- 2018. TOO Nur-Print (available in the library and at the department) 2. Malte Faber, Reiner Manstetten "Philosophical Basics of Ecology and Economy" ISBN: 0415494559, 208p, 2009 Rutledge (available in the library) 3. Donchenko V.K., Pitulko V.M., Rastoskuev V.V., et al. Ecological Expertise. - M.: Publishing Center "Academy", 2004.(available in the library) 4. Galanevich, A.G. Environmental Impact Assessment and Ecological Expertise // Ecological Expertise. No. 3, -M. 1999 (available in the library) 5. Bespamiatov G. P., Krotov Yu. A. Maximum permissible concentrations of chemical substances in the environment. Directory. L .: Chemistry, 1985. (available in the library) Butorina M.V., Vorobiev P.V., Dmitrieva A.P., et al. Engineering ecology and environmental management. M.: Logos, 2003. (available in the library)

Module 51

Course code and name	ECOL 33014 Environmental engineering
Semester(s) when the course is taught	6
Person responsible for the module	Massenov Kairat Bagasharovich., candidate of technical sciences Professor
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)

Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks:Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized. Case study, brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method, lecture-conference, “hot chair” method, model method (real situation modelling).
Workload (incl. contact hours, self-study hours)	Total workload: 180 hours. Lectures: 30 hours, practical: 30 hours, independent work of students: 120 hours.
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	"Industrial Ecology", "General Ecology", "Chemistry of the Environment", "Man and the Biosphere", "Human Ecology". "Analytical chemistry and physico-chemical methods of analysis". List of related disciplines: Ecological modeling; Environmental audit; Environmental regulation and expertise, protection of natural resources
Course objectives/intended learning outcomes	The purpose of the discipline is to acquaint students with the scientific and methodological foundations for studying industrial aspects, the impact of industrial enterprises on natural objects, the processes occurring in the air, water and soil when pollutants enter, and the ability to prevent environmental pollution. After studying the subject "Environmental Engineering", the student: - know the basic patterns of industrial production and methods for cleaning industrial emissions into the atmosphere - be able to analyze the possible variability of emissions and discharges of industrial enterprises into the air, water and soil and their impact on living organisms; - have the skills of analytical detection of industrial emissions from natural objects.
Content of the course	Engineering environmental protection is a set of scientific and engineering principles aimed at improving the natural environment, providing humans and other organisms with clean water, air and land, as well as cleaning up polluted areas. In order to achieve maximum environmental safety of human activity and reduce the risk of anthropogenic impact on the environment, specialists in this field of knowledge - environmental engineers develop, design, regulate, use and improve environmental practices and technologies, organize environmental protection. work at enterprises and territorial production complexes, examination of projects, technologies and industries, product certification
Examination forms	Orally
Study and examination requirements	The exam on the subject of Industrial ecology is taken orally. Because: First of all, in order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. Second, the third question of the exam questions of this discipline can be assessed in the form of calculations, and it can be assessed only by asking the meaning of oral formulas. Thirdly, I think that only the oral exam method allows you to fully assess the knowledge of students (for example, to ask additional questions).

Technical and electronic learning tools	In the process of teaching students the subject of Environmental Engineering, an electronic textbook prepared by the author (November 6, 2019 No. 6273), video lectures, as well as interactive whiteboards, multimedia technical means are used.
Reading list	1. Massenov KB; Abseitov E.T. Monograph "Engineering protection of the environment" VOLUME № 1, 288 pages**.** ISBN 978-601-238-540-3 2018 y (available in the library and at the department) 2. Massenov KB; Abseitov E.T. Monograph "Engineering protection of the environment" VOLUME № 2 263 pages**.** ISBN 978-601-238-540-3 2018 y (available in the library and at the department) 3. Massenov KB; Abseitov E.T. Monograph A-17 “Industrial ecology» , 398 pages**.** ISBN 978-601-238-541- 0. 2018 y (available in the library and at the department) 4. Massenov KB; Abseitov E.T. Textbook "Industrial ecology", 480 pages ISBN 9965-799-84-9 2018 y (available in the library and at the department) 5. Massenov KB; Abseitov E.T. Aytlessov K Textbook "Industrial Ecology" 207 pages . ISBN 978-601-206-064-5 2018 y (available in the library and at the department) 6. A. G. Vetoshkin. Theoretical basis of environmental protection: Proc. allowance. - Moscow: Higher School., 2008 - 397p. (available in the library) 7. Massenov KB; Abseitov E.T..Educational and methodical complex “Industrial ecology» UDK 574 (072) (available in the library and at the department) 8. И‌И. Mazur, OI Moldavanov Course of engineering ecology. Moscow "High School" 2001. (available in the library) https://www.microsoft.com/ https://www.socrative.com/

Module 52

Course code and name	ECOL 33015 Ecological audit
Semester(s) when the course is taught	6
Person responsible for the module	Adilbektegi G. - Candidate of Geographical Sciences, Acting Associate Professor of the Department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: interactive method, multimedia lecture, project method. Practical work: Work on the ERA-air, ERA-risks, ERA-waste, ERA-climate, ERA-class program. Group work. Each subgroup is prepared individually, and each subgroup makes its own calculation on the topic of practical work. Tasks of theIWS: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	Total workload: 180 hours. Lectures: 30 hours, practical: 30 hours, independent work of students: 120 hours.
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	Social ecology

Course objectives/intended learning outcomes	Choose rational ways to solve eco-friendly production, own ecological and economic EIA using information technology, collection, storage and processing of environmental information. Study of issues of non-departmental assessment of the company's activities under environmental legislation, regulatory and legal acts, regulatory documents in the field of environmental protection and nature management, economic entities and the state of the OS - objects of environmental auditing.
Content of the course	The course «Environmental audit» is designed to study an independent, objective non-departmental assessment of the company's activities for compliance with current environmental legislation, regulatory acts, methodological and regulatory documents in the field of environmental protection and environmental management, the activities of business entities and the state of the environment - the objects of environmental audit.
Examination forms	During the academic semester, two intermediate examinations are conducted (the first after the seventh week of study and the second after the 15th week before the exam) to test students' knowledge. The time for intermediate control is 50 minutes. The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	The exam on the discipline «Environmental audit» is given orally. Firstly, in order to comprehensively test the knowledge of students, in-depth determination of their speech skills, the ability to express their thoughts, oral communication is necessary. Secondly, exam questions on a given discipline can be evaluated in the form of examples. Thirdly, only the oral method of the exam allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	Interactive whiteboard, multimedia equipment, electronic library. Programs ERA-air, ERA-risks, ERA-waste, ERA-climate, ERA-class https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/ https://www.socrative.com/
Reading list	1. Prituzhalova, O. A. Environmental management and audit: textbook for universities / O. A. Prituzhalova. - M.: Yurayt Publishing House, 2019. - 244 p. 2. Izmalkova S.A. Environmental management: a textbook for higher professional education . - Eagle: FSBEI HPE "Gosuniversitet - UNPK", 2016. - 164 p.

Module 53

Course code and name	ECOL 33016 Greenhouse gas management
Semester(s) when the course is taught	6
Person responsible for the module	Zhumabaeva Saule
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks: prepares each subgroup of scientific discoveries on the topic; videos, presentations. Debates will also be organized and discussed.

Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Geoecology, ecological geology, social ecology, methods of geoecological research.
Course objectives/intended learning outcomes	based on international, regional, national and local initiatives to limit the concentration of greenhouse gases in the global atmosphere and is based on the calculation, control, reporting and verification of emissions and/or greenhouse gas emissions.
Content of the course	a lot of heat is stored in the atmospheric layer and a natural greenhouse effect is created, while at the global level the average temperature always rises slightly, which leads to serious changes in the future. These events, called climate change, are one of the most important obstacles faced by countries, governments, businesses and humanity.
Examination forms	Orally
Study and examination requirements	The exam on the discipline "Greenhouse gas emissions management" is taken orally. The reason: Firstly, a comprehensive examination of students' knowledge and in-depth determination of their communication skills, the ability to express their thoughts are determined only by an oral exam. Secondly, the third question of the examination tickets for this discipline is given for analysis. Thirdly, I believe that only the oral exam method allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	The discipline of greenhouse gas emissions management in the process of teaching students uses an electronic textbook, video lectures, as well as an interactive whiteboard, multimedia technical means
Reading list	"EDGAR-CO2 waste emissions in all countries of the world, report for 2018-European Commission"" edgar.jrc.ec.europa.eu . retrieved November 28, 2019. site:kk.wikisko.ru . Mirnova S.S. Atmosphere. All about the Earth's Air Ocean 2014. World Development Report 2010. Development and climate change. - Moscow: The Whole World, 2019

Module 54

Course code and name	INEX 32050 Industrial Practice
Semester(s) when the course is taught	8
Person responsible for the module	Candidate of Biological Sciences, PhD, Associate Professor Kobetayeva N.K.
Language	English
Within the curriculum (cycle, component)	For programm 6B05208 – Ecology and nature management in which the module is taught ECOL 22009 Fundamentals of Natural Sciences, semester- 6, BD UC-basic discipline, university component
Teaching methods	Industrial practice is aimed at expanding and consolidation of theoretical and practical knowledge acquired by students in the course of training, acquisition and improvement of practical skills in the chosen educational program, preparation for future professional activities. Being the central link in the system of training of specialists, industrial practice helps students to understand better the correctness of their professional choice, to check the assimilation of theoretical knowledge received during the training, and to determine professionally important qualities of the future specialty. Using the unique capabilities of the organization allows to adapt the knowledge and skills of students to the conditions of specific industries already in the process of training.
Workload (incl. contact hours, self-study hours)	Practice-90
Credit points (total by discipline)	3 ECTS
Required and recommended prerequisites	Fundamentals of biology, geography, chemistry, mathematics, physics, as

for joining the course	well as the disciplines of bioecology, introduction to the specialty
Course objectives/intended learning outcomes	The purposes of industrial practice of the 4th course are: acquaintance with problems of rational nature management, ecological consequences of anthropogenic activity; mastering by students of practical skills of research of ecological condition of objects, methods of studying, control and estimation of ecological changes of the environment; realization of theoretical knowledge acquired in the course of training and acquisition of practical skills of industrial activity. The objectives of the 4th year production practice are: 1. familiarization of students with the main methods of assessing the ecological condition of various territories, components of the natural environment; Familiarization with the organization that is the base of the practice, the structural unit where the practice takes place; 3; 3. to study the normative-legal documents regulating the activities of the respective practice facility 4. Participation in the current production activity, acquisition of skills of collective production activity; 5. Analysis of efficiency of work of subdivisions of the enterprise (organization); 6. Development of proposals to improve the efficiency of functioning of the subdivisions of the base of practice; 7. Development of creative, research approach, development of skills to analyze the results of their work.
Content of the course	Intensification of economic and industrial activity of man in modern conditions of nature management and global scales of his anthropogenic impact on the main components of the biosphere create a situation of acute ecological crisis caused by degradation of environmental objects. In this regard, environmental impact management plays an important role in optimizing the conditions of interaction between man and nature. Students should know: - methods of assessing the impact on the natural environment; - methods of ecological monitoring of natural environment; - methods of scientific experiment in laboratory, field and industrial conditions
Examination forms	The exam is given in the oral form, that is, in the form of protection of the report. The form of intermediate control of the student intern on the results of all types of professional practice is differential credit (protection of the report at the meeting of the Commission of the graduating department). During the protection of the results of practice the student intern reports on its results, answers the questions, provides a package of documents on the results of professional practice and expresses the commission its own conclusions and suggestions.
Study and examination requirements	According to the results of the professional production practice the student provides reporting documentation to the department: practice diary-report (report at the discretion of the department). At the end of practice the student must demonstrate the acquired skills and experience. - filled-in internship report; - filled-in internship diary; - characteristic given by the head of practice; - completed individual assignment from the department (if any) Besides, the instructor develops criteria of knowledge, abilities and skills estimation. These criteria take into account specifics of the discipline. Assessment criteria are available to all students in the curriculum of the disciplines.
Technical and electronic learning tools	Computer, projector, interactive whiteboard
Reading list	1. Gorshkov M.V. Ecological monitoring. Moscow 2010, 425 pp. 2.Ashikhmina T.Y. Ecological monitoring. T.Ya. Ashikhmina.-M.:

	Academic project, 2019 .-- 416 p. 3. Vartanov, A.Z. Methods and instruments of control of the environment and environmental monitoring / A.Z. Vartanov, A.D. Ruban, V.L. Skinner. - Vologda: Infra-Engineering, 2016 .-- 640 p. 4. Kropotov Y. A., Proskuryakov A. Y., Belov A. A. Algorithms of automated systems of ecological monitoring of industrial production: a monograph 5. Bigaliev A.B., Khalilov M.F., Sharipova M.A. Fundamentals of general ecology Almaty, "Kazakh University", 2007. 6. Conservation of Biodiversity in Central Asia. Kazakhstan, Edited by T.M. Bragina, O.B. Pereladova. Almaty, 1997. 7. A.V. Chigarkin. Geoecology and Nature Conservation of Kazakhstan - Almaty: Kazakh University, 2003, - 338 p. 8. S.A. Pavlovitch, Somodel Collections on Botany, Moscow, 1961. 9. M. Kozlov, E. Nienburg, Your Collection, Gathering and Making Zoological Collections, Moscow, Prosveshchenie, 1971. 10. Emelyanov, A.G. Bases of nature management: textbook / A.G. Emelyanov. - 2nd ed. - Moscow: Academy, 2006. 304 p. 11. Fokin, Y. G. Theory and technology of training: activity approach: textbook for universities / Y. G. Fokin; ed. G. Fokin. - Moscow: Academy, 2006. Environmental expertise: textbook / V.K. Donchenko; ed. by V. M. Pitulko. M. Pitulko. - 2nd ed. ; stern. - Moscow: Academy, 2005.

Module 55

Course code and name	ECOL 42001 System Ecology
Semester(s) when the course is taught	7
Person responsible for the module	Massenov Kairat. candidate of technical sciences, professor of the department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): communicative method, method of 6 hats, cinquain method, interactive method. SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized. GIS programme.
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total - 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	General ecology; Mathematical modeling in ecology; Industrial ecology; Analytical chemistry; Human ecology
Course objectives/intended learning outcomes	Objectives: Features and interrelation of the main components of the ecosystem, the ability to perform systematic analysis in solving major problems in general ecology Be able to organized world system, metabolism, energy flow in ecosystems, and biological stability of the environment. Have skills - to have skills of ecological model of the population, ecosystem and world simulation model.
Content of the course	Fundamentals of system theory and GIS, system analysis. Formation of the system idea of ecology, the basic principles of systemology, the structure of the ecosystem, the circulation of matter and energy in the ecosystem, the information process in the ecosystem. Ecological model and modeling. Element of systematic analysis of ecology in environmental protection.

Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam on the subject of System Ecology is taken orally. Because: In order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. In addition, I think that only the oral examination method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	ENU website systems: MOOC, MOODLE, MSTeams; using a multimedia whiteboard during classes https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/
Reading list	1. Petrosyan L. A. Introduction to mathematical ecology / L. A. Petrosyan, V. B. Zakharov. - L .: Leningrad Publishing House. University, 1986. (Available in the University Library) 2. Reimers N. F. Ecology (theories, laws, rules of principles and hypotheses). M .: Young Russia, 1994 . (Available in the university library) 3. Smith J. Models in ecology. - M .: Mir, 1987. 4. Волкова B. P. Fundamentals of the theory of systems and systems analysis / V. P. Volkova, A. A. Denisov. SPb .: SPb. GTU, 1997.

Module 56

Course code and name	ECOL 43001 Ecological safety and forecasting
Semester(s) when the course is taught	7
Person responsible for the module	Daribai Ainur., PhD, Assistant professor of the department
Language	Kazakh
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Oral explanation. Case study, brainstorming. Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total - 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Existing competences in soil ecology, ecologicalaudit, waste managementmethods of geoecological researches.. List of related subjects: chemistry, physics of environment, ecology of the person, social ecology, plant ecology

Course objectives/intended learning outcomes	Objectives: The purpose learn to identify local, regional, global environmental sources of environmental hazards, choose rational solutions to eliminate threats to ecosystems, own environmental-economic methods of environmental impact assessment; the ability to make forecasts based on the collection, systematization and processing of environmental information; The discipline studies the methods of predicting the state of the environment and the possibilities of applying the methods of forecasting. Know: the basic concepts of forecasting the state of the environment and the history of its development, its relationship with ecology Have skills: students to apply knowledge processing of control results, planning of experiments, assessment of the quality of environmental components, forecasting. Competences: Students are supplementation of knowledge, including environmental protection, interaction of living organisms with the environment, forecasting of air pollution and climate change, pollution prevention measures.
Content of the course	The course forms the knowledge of future professionals, including the protection of the environment, the conditions of interaction of living organisms with the environment, including the forecasting of air pollution and climate change, pollution prevention measures.
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam on the subject of Industrial ecology is taken orally. Because: First of all, in order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. Second, the third question of the exam questions of this discipline can be assessed in the form of calculations, and it can be assessed only by asking the meaning of oral formulas. Thirdly, I think that only the oral exam method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	MS Teams, MOOC, MOODLE on the ENU website, the use of multimedia boards in the classroom https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/
Reading list	1.Tumenbaeva, N. Environmental control, Astana, 2012 2.Berlin, M.E. Forecasting and regulation of atmospheric pollution. Leningrad: Hydrometeorology, 2005 3.Aidosov, A. Theoretical bases of forecasting of natural processes and ecological environment of the environment.- Almaty: Kazakh University, 2000

Module 57

Course code and name	ECOL 43002 Recreational Ecology
Semester(s) when the course is taught	7
Person responsible for the module	Khusainov M.B.
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)

Teaching methods	Lecture: Multimedia lecture. A video lecture developed by the author of the discipline. Questions and answers. Group work, communicative method, 6 hat method, cinquain method Showing short videos on the topic of the lecture Workshop tasks (practice): The group is divided into several subgroups. Each subgroup is prepared individually, each subgroup makes its own calculation on the topic of practical work Tasks of the IWS: Preparation of abstracts, presentations, videos on the topic;
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Available competencies in the field of ecology, environmental toxicology, biogeochemical monitoring, animal and plant ecology, environmental audit, waste management. List of related disciplines: chemistry, environmental physics, human ecology, social ecology, plant ecology
Course objectives/intended learning outcomes	The objectives of mastering the discipline are to increase the level of ecological outlook among students, to replenish the complex of basic environmental knowledge, as well as to form the ability to assess the possible consequences of their professional activities in the field of recreation and tourism activities on natural processes.
Content of the course	Introduction to recreational ecology. Natural resources and recreation. Recreational resources. The role of specially protected natural areas in the improvement and environmental education of the population. The importance of national nature parks in the development of ecotourism. Climate as a recreational resource. The degree of comfort of weather conditions. Hydrographic (ocean, surface reservoirs, springs) and hydromineral (therapeutic mineral waters; therapeutic mud; therapeutic clay) recreational resources. The importance of forests as a recreational resource. The importance of flora and fauna for recreation, tourism and recreation of vacationers. Spelling recreational resources.
Examination forms	The exam is taken orally by the student.
Study and examination requirements	During the academic semester, two intermediate tests are conducted (the first after the seventh week of study, the second on the 15th week before the exam) to test students' knowledge. The time of intermediate control is 50 minutes. The exam is given orally, that is, in the form of an examination ticket. Exam tickets consist of 25 options. Each ticket consists of 3 questions. Exam questions cover all the material passed during 1 semester of full training in a lecture and practical lesson. Taking oral exams of students in the form of examination tickets, we can fully test their knowledge: knowledge about the main functional ecological units: individual species, populations, biogeocenoses, ecosystems; to master the problems of natural resources and their effective use - to form theoretical knowledge about the biosphere - the global ecosystem; to assess perfectly how much they have mastered the emphasis on knowledge about modern environmental problems and their development.
Technical and electronic learning tools	Interactive whiteboard, multimedia equipment, electronic library.

Reading list	1. Kononova, M.Y. Ecology: Ecological foundations of tourism and sports facilities: textbook / M.Y. Kononova; Ministry of Education and Science of the Russian Federation, St. Petersburg State Polytechnic University. - St. Petersburg : Polytechnic University Publishing House, 2014. - 186 p. : schematics, tables, ill. - Bibliogr. in the book. - ISBN 978-5-7422-4302-1 ; 2. Sergeeva T. K. Ecological tourism : textbook on the spec. "Organization Management" / Sergeeva T. K. ; Russian International Academy.- M. : Finance and Statistics, 2004. - 360 p. : ill. - ISBN 5-279-02819-3 : 89-25. 3. Ecological tourism in the National Park and its educational potential / Gudym A. Yu.// Secondary vocational education. - 2012. - No. 8. - pp. 10-13. 4. Zateev A. A. Actual problems of ecological tourism in modern Russia / Zateev A. A.// Geography at school. - 2011. - No. 3. - pp. 61-63. Khrabovchenko, V.V. Ecological tourism / V.V. Khrabovchenko. - M. : Finance and Statistics, 2007. – 208 p. : ill., table. - Bibliogr.: pp. 203-204. - ISBN 978-5-279-02528-2.

Module 58

Course code and name	ECOL 43003 Mechanisms of environmental management
Semester(s) when the course is taught	7
Person responsible for the module	Bakeshova Zh.U. senior lecturer, Kobetaeva N.K., PhD, Associate Professor of the department
Language	Kazakh
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Traditional, problematic, multimedia lecture. Interactive method. Tasks for the seminar (practice): Case study, brainstorming, group work, communicative method, method of 6 hats. Tasks for IWS: differentiated approach, project method.
Workload (incl. contact hours, self-study hours)	Total workload: 150 hours. Lectures: 30 hours, practical: 15 hours, independent work of students: 105 hours.
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Available competencies in the field of ecology, environmental toxicology, biogeochemical monitoring, ecology of animals and plants. List of related disciplines: chemistry, environmental physics, human ecology, social ecology, plant ecology
Course objectives/intended learning outcomes	Objective: to identify and correctly select all the necessary environmental management technologies to eliminate violations of the structure and functions of ecosystems, to possess methods and ecological and economic fundamentals of environmental impact assessment.
Content of the course	The subject includes environmental management of the environment, theory and practice of sustainable development, management principles and environmental aspects, interpreted as a field of general knowledge. Means to achieve the goal: motivation to find students in the store, independent work of students with a teacher. The content of the discipline consists of topics; 1. Economic mechanisms of environmental protection 2. Planning and financing of environmental protection measures; 3. Setting limits on the use of natural resources, emissions and discharges of pollutants into the environment and waste disposal; 4. establishment of payment standards and amounts of payments for the use of natural resources, emissions and discharges of pollutants into the environment, waste disposal and other types of harmful effects; 5. Compensation in accordance with the established procedure for damage caused to the environment and human health.

Examination forms	During the academic semester, two intermediate tests are conducted (the first after the seventh week of study, the second on the 15th week before the exam) to test students' knowledge. The time of intermediate control is 50 minutes. The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	Taking an oral exam has certain advantages, as it allows you to prepare an answer in the most complete, reasoned and detailed form with examples and explanations. Forms a creative approach of students to the subject, promotes the development of skills of analysis and generalization of the studied material, which, in turn, leads to a deep understanding and formation of a complex, holistic and interrelated understanding of the subject. the discipline being studied.
Technical and electronic learning tools	Interactive whiteboard, multimedia equipment, electronic library.
Reading list	1. Mamyrov N.K., Tonkopiy M.S., Upushev E.M. Economics of nature management: Textbook. Almaty: Ekonomika, 2005 - 368b. 10 2.OS. Shimova, N.K. Sokolovsky. Fundamentals of ecology and Economics of nature management: Textbook. / 2nd ed., ispr. and add. - Minsk: BSEU, 2002 .-- 367 p. ISBN 985-426-797-0. https://www.socrative.com/ Google (Google Class/ GoogleForms) Microsoft Teams

Module 59

Course code and name	ECOL 43004 Environmental Impact Assessment
Semester(s) when the course is taught	7
Person responsible for the module	Adilbektegi G.A.
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: interactive method, multimedia lecture, project method. Seminar assignments (practice): ERA air licensed program. Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total – 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Ecological monitoring
Course objectives/intended learning outcomes	Purpose: identify and describe the main local, regional, global environmental conditions, own methods and environmental-economic assessment of environmental impact based on the collection and processing and analysis of environmental information; Course is designed to study the procedure in which the possible consequences of planned economic and other activities, improve the environment with taking into account the requirements of the environmental legislation.Tools to achieve the goal: motivation of students to research, independent work of students with a teacher.
Content of the course	The course "Environmental Impact Assessment" is intended to study the procedure within which the possible consequences of planned economic and other activities for the environment and human health are assessed, measures are developed to prevent adverse consequences (destruction, degradation, damage and depletion of natural ecological systems and natural resources), improvement of the environment, taking into account the requirements of the environmental legislation of the Republic of Kazakhstan.

Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam on the subject "Environmental Impact Assessment" is taken orally. As: First of all, in order to fully test the knowledge of students, a deep definition of their speech skills, the ability to express their thoughts is determined only by oral communication. Secondly, exam questions in a given discipline can be graded in the form of examples. Thirdly, only the oral examination method allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	MS Teams, MOOC, MOODLE on the ENU website, the use of multimedia boards in the classroom https://kahoot.com/ https://www.microsoft.com/
Reading list	Fedorova, A.I. Workshop on ecology and environmental protection: textbook for universities / A.I. Fedorova, A.N. Nikolskaya, Moscow: Humanitarian publishing center VLADOS, 2003, 288 p. Rozanov, S.I. General ecology: a textbook for technical directions and specialties / S.I. Rozanov. - 3rd ed., Stereotype. - SPb .: Lan, 2003. - 288 p.

Module 60

Course code and name	ECOL 43005 Environmental biotechnology
Semester(s) when the course is taught	7
Person responsible for the module	Zhantokov B.Zh., senior lecturer of the department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. A video lecture developed by the author of the discipline. Questions and answers. Case study, brainstorming. Workshop tasks (practice): Divide the group into several subgroups. Each subgroup is prepared individually, and each subgroup makes its own calculation on the topic of practical work SRO tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total – 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, it is necessary to know environmental monitoring, bioecology, biodiversity of biocenoses, biological components of the environment
Course objectives/intended learning outcomes	Objectives of the discipline: is the study of the special application of biological systems and processes to solve problems of environmental protection and rational use of natural resources. The purpose of studying the discipline: is to master the principles and methods of isolation, to study the identification of the main groups of microorganisms, to study the features of their physiology, which makes microbes promising objects of biotechnological research.

Content of the course	Ecological biotechnology is one of the sections of biotechnology dedicated to solving problems of environmental protection and rational use of natural resources using biological systems and processes. These processes include the disposal of agricultural, household and industrial waste, the treatment of wastewater and gas emissions, the destruction of xenobiotics, the production of effective and non-toxic drugs to combat diseases and pests of cultivated plants and domestic animals, as well as the creation of alternative and environmentally friendly methods of reproduction of food, medicines, energy and mining.
Examination forms	The exam on the subject of Environmental biotechnology is taken orally.
Study and examination requirements	The exam on the subject of Environmental Biotechnology is taken orally. Because: In order to fully test students' knowledge, to deeply determine their conversational skills, the ability to express their thoughts is determined only by oral communication. In addition, I believe that only the oral exam method allows you to fully assess students' knowledge (for example, ask additional questions).
Technical and electronic learning tools	MSTeams, MOOC, MOODLE on ENU website, use of multimedia whiteboards in lessons
Reading list	Scientific foundations of ecobiotechnologies: a textbook / Alexander Evgenievich Kuznetsov, Nina Borisovna Gradova. - M.: Mir, 2016. Fundamentals of biotechnology / K. H. Almagambetov. - Astana : NCB MES RK, 2006. Ecological biotechnology. / edited by K. Foerster and D. Weitz – L., 1990. Agricultural biotechnology: textbook for universities / V. S. Shevelukha, E. A. Kalashnikova, E. S. Voronin, etc.; edited by V. S. Shevelukha. - 2nd ed., reprint. and add.. - M.: Higher School, 2013. Google (Google Class / Google Forms) Microsoft Teams

Module 61

Course code and name	ECOL 43007 Ecological zoning and sensing
Semester(s) when the course is taught	7
Person responsible for the module	Zhantokov B.ZH., Zandibai A.
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Case study, brainstorming, works in group, communicative method, method of 6 hats. SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized.
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total - 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, it is necessary to know the ecological monitoring, ecology of geosystems

Course objectives/intended learning outcomes	The objectives of the study of the discipline: to develop students 'understanding of the use of geoinformation systems, to supplement students' knowledge of the concept of spatial data, about geoinformatics as a science. Objectives of the study of the discipline: - introduction to theoretical questions and basic postulates of geoinformatics; - development of ideas about how to collect and encode field research; - development of map information input views; - consideration of the theory of geoinformation modeling; - familiarization with the methods of geographical representation of information in GIS.
Content of the course	The following are the requirements for the professional readiness of the graduate, the formation of which is influenced by the development of the discipline "GIS Tools" in combination with other disciplines of training in the direction. Construction of mathematical models of research objects and the choice of a numerical method for their modeling, the choice of a ready-made or the development of a new algorithm for solving the problem. Performing mathematical (computer) modeling and optimization of objects on the basis of available research and design tools, including standard and specialized application software packages.
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam on the subject of Ecological zoning and sensing is taken orally. Because: In order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. In addition, I think that only the oral examination method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	ENU website systems: MOOC, MOODLE, MSTeams; using a multimedia whiteboard during classes
Reading list	Mathematical modeling and identification of geodynamic systems [Electronic resource]: monograph / V. K. Pankrushin. - Novosibirsk : SGGA, 2002 Tips.B. Ya. Information technologies [Text] Textbook for universities/ B. Ya. Soviets, V. V. Tsekhanovsky. . Research and analysis of the accuracy of special engineering and geodetic networks by the method of mathematical modeling [Electronic resource]: method. instructions / A. P. Karpik, I. N. Chesheva ; SGGA. - Novosibirsk : SGGA, 2009 https://www.microsoft.com/ https://www.socrative.com/

Module 62

Course code and name	ECOL 43007 Climate change and the «green» economy.
Semester(s) when the course is taught	7
Person responsible for the module	Zhantokov B.ZH., senior lecturer of the department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)

Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers. Case study, brainstorming. Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total – 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, it is necessary to know the ecological monitoring, bioecology, biodiversity of biocenoses, biological components of the environment/
Course objectives/intended learning outcomes	Objectives of the study of the discipline: is the study of the special application of biological systems and processes for solving problems of environmental protection and rational use of natural resources. The objectives of the study of the discipline: is to master the principles and methods of isolation, study the identification of the main groups of microorganisms, study the features of their physiology, making microbes promising objects of biotechnological research.
Content of the course	Ecological biotechnology is one of the sections of biotechnology dedicated to solving the problems of environmental protection and rational use of natural resources using biological systems and processes. These processes include the disposal of agricultural, household and industrial waste, the treatment of wastewater and air-gas emissions, the destruction of xenobiotics, the production of effective and non-toxic drugs to control diseases and pests of cultivated plants and domestic animals, as well as the creation of alternative and environmentally friendly methods for the reproduction of food, medicines, energy and mining.
Examination forms	The exam on the subject of Environmental biotechnology is taken orally.
Study and examination requirements	The exam on the subject of Environmental biotechnology is taken orally. Because: In order to fully test the knowledge of students, a deep definition of their speaking skills, the ability to express their thoughts is determined only by oral communication. In addition, I think that only the oral examination method allows you to fully assess the knowledge of students (for example, to ask additional questions).
Technical and electronic learning tools	MS Teams, MOOC, MOODLE on the ENU website, the use of multimedia boards in the classroom
Reading list	Scientific foundations of ecobiotechnology: a textbook / Alexander E. Kuznetsov, Nina B. Gradova. - Moscow: Mir, 2016. Fundamentals of biotechnology / K. H. Almagambetov. - Astana : NCB MES RK, 2006. Environmental biotechnology. / edited by K. Foerster and D. Weiz – - L., 1990. Agricultural biotechnology: textbook for universities / V. S. Shevelukha, E. A. Kalashnikova, E. S. Voronin, et al.; edited by V. S. Shevelukha. - 2nd ed., reprint. and add.. - Moscow: Higher School, 2013. Google (Google Class/ GoogleForms) Microsoft teams

Module 63

Course code and name	ECOL 43008 Paleoecology
Semester(s) when the course is taught	7
Person responsible for the module	Rakhymzhan Zhanar, Orkeyeva A.N.

Language	Kazakh
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Video lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): communicative method, method of 6 hats, cinquain method, interactive method. SIW tasks: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations, and debates on the topic will be organized. GIS programme.
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total - 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	General ecology; Mathematical modeling in ecology; Industrial ecology; Analytical chemistry; Human ecology
Course objectives/intended learning outcomes	Formation of students ' views on the paleoecological situation in the territory of modern Kazakhstan. The study of their flora and fauna in their development related to the evolution of the Earth. Tasks of the discipline: - Familiarization of students with the places of paleoecology in the Earth Science system - Study of the laws of land formation - familiarization with the methods of paleoecology research - study of the terrain and climate of the Earth in former geology - study of the fauna and flora of the Earth in the past geology
Content of the course	In order to better master the discipline" paleoecology", to understand the history of the formation of lands in connection with the problems of modern geoecological research, the laws and principles of the formation of the Earth's crust and the evolution of the organic world on Earth for paleoecological processes, it is necessary to correctly formulate theoretical and practical aspects of the evolution of the Earth for mastering modern geoecological processes of modeling and forecasting. The course "paleoecology" gives an idea of the evolution of climate, terrain, geological past of the diverse biological world of flora and fauna on the territory of Asia.
Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare
Study and examination requirements	The exam and exam in the subject of paleoecology are passed orally. Because: A full test of students ' knowledge, a deep determination of their speech skills, and the ability to express their thoughts are determined only by verbal communication. In addition, in my opinion, only the oral exam method allows you to fully evaluate students ' knowledge (for example, ask additional questions).
Technical and electronic learning tools	ENU website systems: MOOC, MOODLE, MSTeams; using a multimedia whiteboard during classes

Reading list	1.Abilmazhinova, S.A. Paleogeography of Almaty, 2011 2. Bogdanov I. I. Paleoecology, M.-FLINT, 2016. 3. Nikolaev A.N., Pestryakova L. A., Paleoecology. Moscow, , 2016. 4. Yamskikh, G. Yu.; Khabidov, A. Sh.; Borisova, I. V.; Paleoecology Russia: Krasnoyarsk, 2007 5. Sergeev M.G. Paleobiology and Paleoecology Moscow, 2015 6. Kiselev G. N.; Popov A.V. General paleoecology Russia: S-P.Publishing House of St. Petersburg State University, 2000

Module 64

Course code and name	ECOL 43009 Mutagenesis and environment
Semester(s) when the course is taught	7
Person responsible for the module	Akbayeva Lyailya, candidate of biological sciences, professor of the department
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Informational or problematic lecture Seminar assignments (practice): Seminar in the form of a conference, debate, oral survey SIW tasks: performing tasks on the topic of the lecture: essays, watching videos, reading special literature. Case study, brainstorming, works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method, lecture-conference, “hot chair” method, model method (real situation modelling).
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total - 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	To effectively master the content of the discipline, it is necessary to know the basics of biology, geography, chemistry, physics, as well as related disciplines Biology, biodiversity of biocenoses, Introduction to the specialty, bioecology.
Course objectives/intended learning outcomes	Purpose: To give students an understanding of the danger of environmental factors of mutagenesis, the mechanisms and consequences of mutagenesis. To teach students the basic principles of environmental and genetic monitoring, the basics of genetic toxicology Identify the environmental problems associated with the genotoxic influence of environmental factors, as well as to understand and take into account the role of the mutation process in the adaptation and evolution of organisms. Objectives of the course: 1. To master theoretical knowledge concerning the process of mutagenesis. 2. To master methods for solving practical problems to prevent the impact of mutagenic sources on living organisms 3. To master the techniques of laboratory methods to eliminate the consequences of mutagenic effects on living objects.
Content of the course	The content of the discipline "Mutagenesis and OS" offers complex systems of genetic impact of unfavorable environmental factors on plants and animals, types and types of mutation mechanisms, main diseases associated with mutations, as well as the possibility of using mutagenesis in practice. Theoretical knowledge of the basic principles of environmental genetic monitoring, the basics of genetic toxicology and physical mutagenesis. Tools to achieve the goal: the motivation of students to research, independent work of students with a teacher, laboratory work to consolidate skills.

Examination forms	During the academic semester, two intermediate controls are held (the first after the seventh week of study and the second after the fifteenth week before the exam) to test students' knowledge orally. Time for intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket has three questions and the student is given 30 minutes to prepare. Oral examination, The assessment of knowledge in the discipline provides for the formulation of additional questions, for which the student gives oral explanations in the conversation.
Study and examination requirements	Milestone 1 The student must pass 5 essays, write a test, participate in seminars, defend 1 presentation. Milestone 2 The student must pass 4 essays, write a test paper, participate in seminars, defend 1 presentation. Final: The student is obliged to submit lecture notes, self-study notes, take an oral survey on the topics studied. The student must know the basic must be able to identify mutagenic factors and solutions to problems associated with environmental pollution by mutagens. Understand how to minimize the harm of mutagens, and use mutagenesis for good. Compulsory attendance at classrooms, active participation in the discussion of issues, preliminary preparation for lectures and seminars on the teaching aid and basic literature, high-quality and timely completion of IWS assignments, participation in all types of control (current control, IWS control, midterm control, final control).
Technical and electronic learning tools	ENU website systems: MOOC, MOODLE, MSTeams; using a multimedia whiteboard during classes
Reading list	Abilev S. K., Glazer V. M. Mutagenesis with the basics of genotoxicology: a tutorial. - M.; SPb. : Nestor-History, 2015.- 304 p. Alikhanyan S.I., Akifov A.S. General genetics, M., "High School", 2018 Alikhanyan S.I., Akifov A.S. General genetics, M., "High School", 2020 Lobashov M.E., Tikhomirova M.M. Genetics with the basics of selection, M., "Education", 2016 https://www.microsoft.com/ https://www.socrative.com/

Module 65

Course code and name	ECOL 43010 Climatology and meteorology in ecology
Semester(s) when the course is taught	7
Person responsible for the module	Zhumabayeva S.D.
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. lecture developed by the author of the discipline. Questions and answers Show of short videos on the topic of the lecture Seminar assignments (practice): Divide the group into several subgroups. Each subgroup is prepared individually and each subgroup makes its own calculation on the topic of practical work SIW tasks: works in group, communicative method, method of 6 hats, cinquain method, interactive method, differentiated approach, project method, lecture-conference, “hot chair” method, model method (real situation modelling).
Workload (incl. contact hours, self-study hours)	lecture -15, seminar -30, private study-105, total – 150
Credit points (total by discipline)	5 ECTS
Required and recommended prerequisites for joining the course	Environmental studies, Greenhouse gas management, Climate change and the «green» economy, Ecological monitoring

Course objectives/intended learning outcomes	Acquaintance with the system of basic concepts and terms of meteorology and climatology, the formation of ideas about the atmosphere and climate, the definition of the relationship with the environment.
Content of the course	Climate and climate-forming factors, ecological consequences of climate change, temperature change, means of measuring air and soil temperature, meteorological observations, features of heat distribution in the deep layers of the soil and the main hypothesis of climate change, geographical factors and types of climate, prospects and conditions for climate change considers the impact of change climate on humanity and the national economy.
Examination forms	The exam on the subject «Climatology and meteorology in ecology» economy" is taken orally.
Study and examination requirements	The exam on the subject «Climatology and meteorology in ecology» economy" is taken orally. As: First of all, in order to fully test the knowledge of students, a deep definition of their speech skills, the ability to express their thoughts is determined only by oral communication. Secondly, exam questions in a given discipline can be graded in the form of examples. Thirdly, only the oral examination method allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	MS Teams, MOOC, MOODLE on the ENU website, the use of multimedia boards in the classroom
Reading list	1. Morozov A. E. Starodubtseva, N. I. Climatology and meteorology. 2018. 2. Workshop on the discipline "Earth Sciences": guidelines for laboratory work, Part 1. Climatology and meteorology.2014. 3. Khromov S.P., Petrosyants M.A. Meteorology and climatology Textbook. Moscow: Iz-vo Mosk. un-ta: Nauka, 2006. - 582 p.

Module 66

Course code and name	ECOL 43011 Reserve management and studies
Semester(s) when the course is taught	7
Person responsible for the module	Khusainov M.B.
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (optional component)
Teaching methods	Lecture: Traditional, problematic, multimedia lecture. Interactive method. Tasks for the seminar (practice): Case study, brainstorming, group work, communicative method, method of 6 hats. Tasks for IWS: differentiated approach, project method.
Workload (incl. contact hours, self-study hours)	Total workload: 180 hours. Lectures: 30 hours, practical: 30 hours, independent work of students: 120 hours.
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	Available competencies in the field of ecology, environmental toxicology, biogeochemical monitoring, ecology of animals and plants. List of related disciplines: chemistry, environmental physics, human ecology, social ecology, plant ecology

Course objectives/intended learning outcomes	The purpose of the course is to form ideas about the main types of specially protected natural areas and the features of their functioning mode. As a result of mastering the discipline, the student: 1. must know: - know the consequences of anthropogenic impacts on the biosphere, plan measures for its protection; - understand the role of biological diversity as a leading factor in the sustainability of living systems and the biosphere as a whole; - know the main types of protected areas, the system of protected areas in Kazakhstan. 2. must be able to: - be aware of the role of protected areas, protected areas as the basis for biodiversity conservation, - be able to carry out measures to protect biodiversity and rationally use natural resources for economic purposes; 3. must possess: - a system of knowledge about ecosystems and the laws of their organization and functioning; - basic methods of biological and ecological research, the ability to work with living objects and their communities in nature and laboratory conditions; 4. must demonstrate the ability and willingness to: use the acquired knowledge in their professional activities
Content of the course	The main goals and objectives of specially protected natural areas. The main methodological approaches when choosing a territory. Conservation of biodiversity. Maintaining landscape and ecological balance. Scientific research and the Annals of nature. Environmental education and enlightenment in protected areas. Nature reserves, the history of conservation. The history of the formation of protected areas. Reserved territories of past eras. Nature reserves, the history of conservation in the Republic of Kazakhstan. Nature reserves as the highest form of territorial nature protection. National parks, nature reserves. Features of the organization of conservation in the world. National parks, nature reserves. National Parks of the Republic of Kazakhstan. State nature reserves, natural monuments. The current state of protected areas in the world. International classification of protected areas. Global wholesale networks. Territories of the World Natural Heritage. The Convention on the Protection of the World Heritage. Biosphere reserves. Wetlands of international importance
Examination forms	During the academic semester, two intermediate tests are conducted (the first after the seventh week of study, the second on the 15th week before the exam) to test students knowledge. The time of intermediate control is 50 minutes. The exam is conducted orally. The ticket for each exam consists of three questions and is issued to the student for 30 minutes.
Study and examination requirements	Taking an oral exam has certain advantages, as it allows you to prepare an answer in the most complete, reasoned and detailed form with examples and explanations. Forms a creative approach of students to the subject, promotes the development of skills of analysis and generalization of the studied material, which, in turn, leads to a deep understanding and formation of a complex, holistic and interrelated understanding of the subject. the discipline being studied.
Technical and electronic learning tools	Interactive whiteboard, multimedia equipment, electronic library.
Reading list	1. Galperin M. V. Ecological foundations of nature management: Textbook / M.V. Galperin. - 2nd ed., ispr. - M.: ID FORUM: INFRA-M, 2012. - 256 p.: http://znanium.com/bookread.php ?book=305572 2. I.O.Salpagarov D.S.Nature protection and conservation (course of lectures) : textbook. manual for students in agronomic specialties. Stavropol, 2006. 3.Galay, E. I. Use of natural resources and nature protection / E.I. Galay., -Minsk: Amalfea, 2007., 251 p.

Module 67

Course code and name	ECOL 43012 Ecology of Kazakhstan	
Semester(s) when the course is taught	7	

Person responsible for the module	Kobetaeva N.K -PhD, associate professor
Language	Russian
Within the curriculum (cycle, component)	Profile discipline (optional component)
Teaching methods	Lecture: Multimedia lecture. Oral explanation. Questions and answers, showing short videos on the topic of the lecture. Seminar tasks (practice): differentiated approach, project method, lecture-conference, "hot chair" method, model method (modeling of a real situation). SIW assignments: Each subgroup prepares scientific news on the topic for the last 3 years; videos on the topic of practical work, presentations and debates on the topic will be organized
Workload (incl. contact hours, self-study hours)	Total workload: 180 hours. Lectures: 30 hours, practical: 30 hours, independent work of students: 120 hours.
Credit points (total by discipline)	6 ECTS
Required and recommended prerequisites for joining the course	Existing competencies in the field of ecology, environmental audit, waste management. List of related subjects: chemistry, environmental physics, human ecology, social ecology, plant ecology.
Course objectives/intended learning outcomes	Tasks: to identify and describe the main national environmental problems, to choose rational solutions to eliminate violations of the structure and functions of ecosystems, to be able to collect, store and process environmental information for analysis and assessment. To know: environmental problems, knowledge in the field of environmental monitoring, characteristics of natural resources with timely detection of environmental changes, analysis of experimental material, various mathematical and statistical formulas and methods Possess: the skills of studying and analyzing complex environmental problems and their forecasting, carrying out preventive measures Competencies: methods of rational use of resources, information support, assessment of resource protection.
Content of the course	The course forms the knowledge of future specialists, including environmental protection, environmental problems of Kazakhstan and measures to prevent pollution of the atmosphere, hydrosphere and lithosphere.
Examination forms	During the academic semester, two intermediate controls are carried out (the first - after the seventh week of study and the second - after the fifteenth week before the exam) for an oral examination of students' knowledge. The time of intermediate control is 50 minutes. The exam is conducted orally. Each exam ticket consists of three questions, the student is given 30 minutes to prepare.
Study and examination requirements	The exam on the subject "Ecology of Kazakhstan" is taken orally. This is explained by the following: Firstly, for a complete test of students' knowledge, a deep definition of their speech skills, the ability to express their thoughts is determined only by oral speech. Secondly, the third question of examination questions in this discipline can be evaluated in the form of calculations, and it can only be evaluated by asking the meaning of oral formulas. Thirdly, I believe that only the oral exam method allows you to fully assess the knowledge of students (for example, ask additional questions).
Technical and electronic learning tools	https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/

Reading list	1. Kozachek A.V. Ecological foundations of nature management, Rostov-on-Don, 2008 2. Kenesariev Yu.I., Ecology and healthcare, Almaty, 2009 3. Ospanova A.K. Ecology and sustainable development.- Pavlodar, 2010.

Module 68

Course code and name	INEX 42060 Industrial Practice
Semester(s) when the course is taught	4
Person responsible for the module	Kobetaeva N.K -PhD, associate professor
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Industrial practice is aimed at expanding and consolidating the theoretical and practical knowledge acquired by students in the learning process, acquiring and improving practical skills in the chosen educational program, preparing for future professional activity. Being a central link in the system of training specialists, industrial practice helps students better understand the correctness of their professional choice, check the assimilation of theoretical knowledge gained during training, and determine professionally important qualities of the future specialty. Using the unique capabilities of the organization allows students to adapt their knowledge and skills to the conditions of specific industries already in the learning process.
Workload (incl. contact hours, self-study hours)	Practice-90
Credit points (total by discipline)	3 ECTS
Required and recommended prerequisites for joining the course	Fundamentals of biology, geography, chemistry, mathematics, physics, as well as the discipline of bioecology, introduction to the specialty.

Course objectives/intended learning outcomes	"Industrial practice" is an integral part of the basic educational program of personnel training. The purpose of the internship is to form students' positive motivation for academic activities and professional competencies, to form the ability to perform various tasks in field practice, to consolidate the disciplines in the field of natural sciences, environmental protection, biological indication, to acquire skills of a creative approach to problem solving. Goals: -Ecological monitoring of natural areas of national parks, the environment and its components, including water, air, soil, flora and fauna. -Familiarity with the peculiarities of the natural environment, as well as work with field research methods. - General assessment of the ecosystems of the territory; -Preparation of herbarium, models, various entomological collections, herbal preparations; - Analysis of biological indicators in various environments To know: - Basic environmental laws; - formation of local ecosystems and landscapes; - laws of biodiversity distribution; - the impact of various factors on the environment. be able to: - to determine the features of the distribution of flora and fauna; - collect herbariums, prepare zoological preparations; - determination of the state of the environment using bioindicators. Master: - methods and techniques of ecological-biological, physical-geographical research in natural territories; - Acquisition of skills in organizing local history work - mastering the skills of teamwork.
Content of the course	Fundamentals of biology, geography, chemistry, mathematics, physics, as well as the disciplines of bioecology, introduction to the specialty.
Examination forms	The exam is given in the oral form, that is, in the form of protection of the report. The form of intermediate control of the student intern on the results of all types of professional practice is differential credit (protection of the report at the meeting of the Commission of the graduating department). During the protection of the results of practice the student intern reports on its results, answers the questions, provides a package of documents on the results of professional practice and expresses the commission its own conclusions and suggestions.
Study and examination requirements	According to the results of the professional production practice the student provides reporting documentation to the department: practice diary-report (report at the discretion of the department). At the end of practice the student must demonstrate the acquired skills and experience. - filled-in internship report; - filled-in internship diary; - characteristic given by the head of practice; - completed individual assignment from the department (if any) Besides, the instructor develops criteria of knowledge, abilities and skills estimation. These criteria take into account specifics of the discipline. Assessment criteria are available to all students in the curriculum of the disciplines.
Technical and electronic learning tools	Computer, projector, interactive whiteboard

Reading list	1. Gorshkov M.V. Ecological monitoring. Moscow 2010, 425 pp. 2.Ashikhmina T.Y. Ecological monitoring. T.Ya. Ashikhmina.-M.: Academic project, 2019 .-- 416 p. 3. Vartanov, A.Z. Methods and instruments of control of the environment and environmental monitoring / A.Z. Vartanov, A.D. Ruban, V.L. Skinner. - Vologda: Infra-Engineering, 2016 .-- 640 p. 4. Kropotov Y. A., Proskuryakov A. Y., Belov A. A. Algorithms of automated systems of ecological monitoring of industrial production: a monograph 5. Bigaliev A.B., Khalilov M.F., Sharipova M.A. Fundamentals of general ecology Almaty, "Kazakh University", 2007. 6. Conservation of Biodiversity in Central Asia. Kazakhstan, Edited by T.M. Bragina, O.B. Pereladova. Almaty, 1997. 7. A.V. Chigarkin. Geoecology and Nature Conservation of Kazakhstan - Almaty: Kazakh University, 2003, - 338 p. 8. S.A. Pavlovitch, Somodel Collections on Botany, Moscow, 1961. 9. M. Kozlov, E. Nienburg, Your Collection, Gathering and Making Zoological Collections, Moscow, Prosveshchenie, 1971. 10. Emelyanov, A.G. Bases of nature management: textbook / A.G. Emelyanov. - 2nd ed. - Moscow: Academy, 2006. 304 p. 11. Fokin, Y. G. Theory and technology of training: activity approach: textbook for universities / Y. G. Fokin; ed. G. Fokin. - Moscow: Academy, 2006. Environmental expertise: textbook / V.K. Donchenko; ed. by V. M. Pitulko. M. Pitulko. - 2nd ed.; stern. - Moscow: Academy, 2005.

Module 69

Course code and name	PWIN 42061 Pre – diploma practice
Semester(s) when the course is taught	8
Person responsible for the module	Kobetaeva N.K -PhD, associate professor
Language	Russian
Within the curriculum (cycle, component)	Basic discipline (elective component)
Teaching methods	Pre-graduate practice is aimed at expanding and consolidating the theoretical and practical knowledge acquired by students in the learning process, acquiring and improving practical skills in the chosen educational program, preparing for future professional activities. Being the central link in the system of training specialists, pre-graduate practice helps students to better understand the correctness of their professional choice, check the assimilation of theoretical knowledge gained during training, and determine professionally important qualities of the future specialty. Using the unique capabilities of the organization allows you to adapt the knowledge and skills of students to the conditions of specific industries already in the learning process.
Workload (incl. contact hours, self-study hours)	Practice-90
Credit points (total by discipline)	3 ECTS
Required and recommended prerequisites for joining the course	Fundamentals of biology, geography, chemistry, mathematics, physics, as well as the discipline of bioecology, introduction to the specialty.

Course objectives/intended learning outcomes	The purpose of the pre-graduate practice of ecologist students is to consolidate the theoretical knowledge gained in the course of training and to master the special skills of an ecologist specialist. The skills acquired in practice constitute research activities, project preparation activities and control and expert activities. The main objectives of the pre-graduate practice are: 1. Collection, processing and generalization of practical material on the topic of the thesis (project); 2. Analysis of statistical data and practical material on the topic of the thesis research; 3. Formulation of conclusions, patterns, recommendations and suggestions on the topic of the thesis; 4. Registration of the thesis (project) in accordance with the established requirements; 5. Application of professional competencies (organizational, communicative, constructive, applied, etc.) in the process of pre-graduate practice.; 6. Improving knowledge, skills and abilities.
Content of the course	The content of the pre-graduate practice is determined by the topic of the thesis. The results of the pre-graduate practice are summed up at the preliminary defense of the thesis (project) organized by the graduating department.
Examination forms	The exam is taken orally, that is, in the form of a report defense. A form of intermediate control of a student-intern based on the results of all types of professional practice is a differentiated credit (protection of the report at a meeting of the commission of the graduating department). When defending the results of the internship, the student-intern reports on its results, answers the questions posed, provides a package of documents on the results of professional practice and expresses his own conclusions and suggestions to the commission.
Study and examination requirements	According to the results of the professional pre-graduate internship, the student provides reporting documentation to the department: diary-a report on the internship (a report at the discretion of the department). At the end of the internship, the student must demonstrate the acquired skills and experience. - completed practice report; - completed practice diary; - the characteristic given by the head of the practice; - completed individual assignment from the department (if available) In addition, the teacher develops criteria for assessing knowledge, skills and abilities. These criteria take into account the specifics of the discipline. Evaluation criteria are available to all students in the curriculum of disciplines.
Technical and electronic learning tools	Computer, projector, interactive whiteboard https://edpuzzle.com/ https://whiteboard.fi/ https://kahoot.com/ https://www.microsoft.com/

Reading list	1. Gorshkov M.V. Environmental monitoring. Moscow 2010, 425 p. 2. Ashikhmina T.Ya. Environmental monitoring. T.Ya. Ashikhmina.- M.: Academic Project, 2019.-- 416 p. 3. Vartanov, A.Z. Methods and devices of environmental control and environmental monitoring / A.Z. Vartanov, A.D. Ruban, V.L. Skinner. Vologda: Infra-Engineering, 2016.-- 640 p. 4. Kropotov Yu. A., Proskuryakov A. Yu., Belov A. A. Algorithms of automated systems of environmental monitoring of industrial production: monograph 5. Bigaliev A.B., Khalilov M.F., Sharipova M.A. Fundamentals of general ecology of Almaty, Kazakh University, 2007. 6. Conservation of biodiversity in Central Asia. Kazakhstan, Edited by T.M. Bragina, O.B. Pereladova. Almaty, 1997. 7. Chigarkin A.V. Geoecology and nature protection of Kazakhstan - Almaty: Kazakh University, 2003, - 338 p. 8. S.A. Pavlovich, Model collections in botany, Moscow, 1961 9. M. Kozlov, E. Ninburg, Your collection, Collection and production of zoological collections, M., "Enlightenment", 1971. 10. Emelyanov, A. G. Fundamentals of nature management: textbook / A. G. Emelyanov. - 2nd ed., ster. - Moscow: Academy, 2006 .304 p. 11. Fokin, Yu. G. Theory and technology of training: activity approach: textbook. handbook for universities / Yu. G. Fokin; edited by V. G. Fokin. - Moscow: Academy, 2006. 12. Ecological expertise: textbook / V. K. Donchenko; edited by V. M. Pitulko. - 2nd ed.; erased. - Moscow: Academy, 2005 .480 p.

Module 70

Course code and name	MFA 420001 Module of final assessment
Semester(s) when the course is taught	8
Person responsible for the module	Beisenova R.R.
Language	English
Within the curriculum (cycle, component)	FA (final assessment)
Teaching methods	-
Workload (incl. contact hours, self-study hours)	360
Credit points (total by discipline)	12 ECTS
Required and recommended prerequisites for joining the course	-
Course objectives/intended learning outcomes	The purpose of the thesis is: - systematization, consolidation and expansion of theoretical and practical, professional knowledge of students obtained by them in the learning process; - mastering the methodology of independent scientific research and experimental research in the development and study of specific issues and problems; - assessment of the degree of preparedness of the student, the acquisition of practical skills, professional competencies that contribute to his independent professional activity.
Content of the course	The thesis defense is carried out in the presence of: - positive feedback from the supervisor; – reviews of the opponent, containing a comprehensive description of the thesis.
Examination forms	Defense of the thesis
Study and examination requirements	Students who have completed the educational process in accordance with the requirements of the educational program, the working curriculum, as well as those who have passed the preliminary defense (extended session) based on the results of the thesis, are allowed to the final certification.

Technical and electronic learning tools	https://edu.enu.kz/, https://www.microsoft.com/, https://fen.enu.kz/subpage/material-no-tehnicheskaya-baza-kaf-obg
Reading list	https://moodle.enu.kz/pluginfile.php/173629/mod_resource/content/2/%D0%9F%D0%BE%D0%BB%D0%BE%D0%B6%D0%B5%D0%BD%D0%B8%D0%B5%20%D0%BE%20%D0%B4%D0%B8%D0%BF%D0%BB%D0%BE%D0%BC%D0%BD%D0%BE%D0%B9%20%D1%80%D0%B0%D0%B1%D0%BE%D1%82%D0%B5%20%D0%9F%20%D0%95%D0%9D%D0%A3%20K-V-24%20%D0%BE%D1%82%2029.11.21.pdf

Considered and approved at the meeting of the department
date 02.03.2022 Record № _8__

Head of Department

Beisenova Raykhan Rymbaevna  02.03.2022
(signature) (date)