Description of the discipline module

Module designation	**LNG202 Foreign language (professional)**
Semester(s) in which the module is taught	1st semester(autumn)
Person responsible for the module	Jukebayev,
Language	English
Relation to curriculum	*Compulsory*
Teaching methods	Practical classes – contact, independent work of a master's student and independent work of a master's student under the guidance of a teacher
Workload (incl. contact hours, self-study hours)	Total workload: Contact hours:3 hours a week and 1 office hour per group
Credit points	*5 ECTS*
Required and recommended prerequisites for joining the module	Availability of the Teams platform
Module objectives / intended learning outcomes	The purpose of the module: to form a foreign language professionally-oriented competence for undergraduates Course objectives: to develop the ability to implement communicative intent in various situations of professionally-oriented oral and written communication based on four types of speech activity: listening, speaking, reading and writing. To teach the use of a foreign language as a means of accumulating information for professional and academic communication. Prepare undergraduates to take certified tests Expected learning outcomes: upon completion of the module, undergraduates will know: -language means of professionally-oriented and academic foreign language communication; -a system of rules for constructing meaningful statements in a foreign language; will be able to use a foreign language as a means of oral and written communication for professional and academic purposes; report and request information, express their own opinion/judgment using argumentation, and evaluative means of language; - logically and consistently build an oral / written statement (in connection with what you have heard / read), expressing your personal attitude to the subject of speech; -use a foreign language as a means of professional and academic interaction
Content	The content of the module is designed for undergraduates of technical specialties to improve and develop foreign language communication skills in the professional and academic sphere. The module introduces students to the general principles of professional and academic intercultural oral and written communication using modern pedagogical technologies (round table, debates, discussions, analysis of professionally-oriented cases, design).
Examination forms	Multivariate test
Study and examination requirements	Mandatory participation in practical training sessions according to the schedule. In case of absence from the lesson, the student is obliged to notify the teacher within a day and provide a plan for self-study of the topic: - - delivery of tasks on time. There are penalties of -10% for late delivery; - 20% non-participation in the audience (for a good reason with supporting documents) - rating "F (Fail)"; - plagiarism and cheating during the execution of the task are not allowed; - mandatory use of electronic gadgets in the classroom, which is welcome, but it is unacceptable to use them in the exam.
Reading list	Oxford *EAP Pre-Intermediate B1 by Richard Storton. Oxford University Press (e - version)* Harrison R. (2015) Headway *academic skills*: listening, speaking, and study skills. Level 3, Student's book. Oxford: Oxford University Press De Chazal E. & Rogers L. (2013) Oxford EAP. A Course in English for Academic Purposes. Intermediate/ B1+. Oxford: Oxford University Press Zemach Dorothy E. & Rumisek Lisa A. (2005). Academic Writing: from paragraph to essay. MACMILLAN.

Module designation	**HUM208 Management psychology**
Semester(s) in which the module is taught	1st semester (autumn)
Person responsible for the module	Mendybaev Serik Kukaevich, Zykova Natalia Mikhailovna
Language	Russian
Relation to curriculum	Required component
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours Lecture-15h, practical classes – 30h. SRO (including SROP) – 105 hours
Credit points	5 credits: contact – 3 (lecture – 1 credit, practice – 2 credits), contactless – 2 credits (SROP, SRO)
Required and recommended prerequisites for joining the module	Philosophy forms and develops critical and creative thinking, worldview and culture, provides students with knowledge about the most general and fundamental problems of existence and gives them a methodology for solving various theoretical and practical issues. Philosophy expands the horizon of the student's vision of the modern world, forms citizenship and patriotism, promotes self-esteem, awareness of the value of human existence. It teaches you to think and act correctly, develops practical and cognitive skills, helps you to search and find ways and ways of living in harmony with yourself, society, and the world around you.
Module objectives / intended learning outcomes	The goal is to know and understand the specifics of philosophy as a science, as the basis for the formation and development of critical thinking and worldview, to see the vital and practical purpose of philosophy. - to develop ways of thinking and understanding alternative to technocracy, the ability to see universal, universal and valuable content in specially scientific and vocational knowledge and cognition, to love and appreciate your work, profession, respect the work of other people - to understand philosophy as the ethics of personal and social life, work and knowledge, as the basis of the morality of society, culture - to know the basic concepts, themes, schools and personalities of philosophy in order to master the historical experience of scientific, critical and creative thinking Skills and abilities (professional, managerial, communicative...) acquired during the course of the discipline - development of constructive critical thinking, worldview; - the ability to effectively use modern technologies for the development of critical thinking in the future practice of scientific and professional activities; - developing your own vision and understanding of the problems of life, society, practice, cognition; - be able to substantiate and defend their views, position, conduct a discussion, polemic, dialogue in a reasoned manner; - development of a culture of professionalism, professional attitude to work, to practical life; - ability to argue and defend their views, positions, conduct a discussion, constructive dialogue, ability to work in a team
Content	In the classroom, technologies for the development of critical, creative and analytical thinking are used: case study, essay writing, etc.
Examination forms	Exam tickets
Study and examination requirements	- Availability of a computer and computer equipment; - Availability of an Internet channel with a speed of at least 0.5 Mbit/sec; - Personal account with a photo of the person on the avatar and corporate mail on the Microsoft 365 platform; - Attendance of classes according to the schedule.
Reading list	1 Merab Mamardashvili My experience is atypical, S.-Pb., ABC, 2000 www.yanko.lib.ru 2 Bertrand Russell History of Western Philosophy http://royallib.com/book/rassel_bertran/istoriya_zapodnoy_filosofii.htm 3 Skirbek G., Gilye N. History of Philosophy. M., Vlados, 2003 4 Philosophy. Textbook (edited by V.D. Gubin and others) M., 2001 5 Golubintsev V.O. et al. Philosophy for technical universities. Rostov-on-Don, 2010, 6 Modern Western philosophy. Minsk, Book House, 2009

Module designation	**GEO209 Geological modeling of MD**
Semester(s) in which the module is taught	1 st semestr (autumn)
Person responsible for the module	Asubayeva Saltanat Kalykbayevna
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits (SROP, SRO)
Required and recommended prerequisites for joining the module	The purpose of the Psychology module is to form a social and humanitarian worldview among students, expand their horizons, and increase the general culture and education of students. As a result of completing the course, students will be able to: - use methods of obtaining psychological information; - apply psychological knowledge to solve professional problems; - think critically; - explain the nature of situations in the field of social communication; - be able to find ways to solve conflict situations in society; - correctly express and reasonably defend their own position; - to know and assume your own identity.
Module objectives / intended learning outcomes	The purpose of studying this discipline is to obtain knowledge, skills and abilities to work with software for three-dimensional geological modeling and evaluation of mineral reserves. To give theoretical and practical knowledge in the field of computer simulation of deposits: in relation to the tasks of geology. Deepening technological education in the field of computer technology.
Content	Introduction The need for computer programs for the visualization and interpretation of various geological exploration data in a 3D environment. Three-dimensional modeling of mineral deposits. Work with graphic applications. Field Modeling and Reserves Estimation with Micromine Software.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: - accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) - creativity and creativity (T) - 30% (how and how the work is presented) - completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) - originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**	
	Completion of tasks (IWUI)	4 IWUI 2 points = 8
	Laboratory work	6 works 4 points = 24
	1st intermediate certification (Midterm)	M-1: 10 points=10
	Independent student work (IWS)	2 IWS 4 points=8
	2nd final certification (Endterm)	M-2: 10 points=10
	Final exam	40
	Total	**100**
Reading list	1] Baybatsha A.B. Geology of mineral deposits. KazNTU, 2008 – 322 p. [2] Baybatsha A.B. Engineering geology of mineral deposits. – Almaty, Gylym, 2003 [3] Belkin V.V. Fundamentals of geology, Berezenki: Perm State Technical University, 2008 – 244 p. [4]https://e-lib.satbayev.university [5] Milyutin A.G. Geology and exploration of mineral deposits. M.: "Nedra", 1989 – 296 p. [6] Kulkashev N.T., Kadykova M.B. Geology of mineral deposits. Methodological guidelines for laboratory classes. twothousandsix [7] Milovsky A.V., Mineralogy and petrography. M., Nedra, 1985.

Module designation	**GEO220 Metallogeny and ore formations of Kazakhstan**
Semester(s) in which the module is taught	1st semester (autumn)
Person responsible for the module	Zhunusov Akylbek Asyrakulovich
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	The aim of the course is to study the basic principles of general metallogeny and familiarize with the content of regional, historical, special metallogeny for the development of the geological foundations of the mining business, as fundamental principles for the development of the mineral industry. The main tasks of studying the discipline are to master the terminology and conceptual framework of metallogenic science and the doctrine of ore formations, the principles of metallogenic and ore-formation analysis; get acquainted with the most important types of ore formations and metallogeny elements of the oceans, platforms and folded systems from the point of view of tectonics of lithospheric plates; have an idea of the metallogenic zoning of the world, the CIS and Kazakhstan
Module objectives / intended learning outcomes	To know: features of metallogeny and mineralogeny in the regions of Kazakhstan. To be able to: conduct an analysis of the structural diagram of various age-related formations; compile a metallogenic map according to the type of mineral; analyze metallogenic maps. To have skills: a comparison of typical ore and geological formations in Kazakhstan compilation and analysis of geological and genetic models of typical ore formations in Kazakhstan: iron ore, gold ore, copper ore.
Content	The concept of metallogeny and mineralogy. Total metallogeny. The concept of ore-forming processes and systems. The concept of ore formation analysis. Geological, ore, metasomatic and metallogenic formations. General principles of metallogenic research. Metallogeny of modern seas and oceans, folded-geosynclinal belts. The basics of metallogeny from the standpoint of modern geodynamics. Metallogeny of rift environments, subduction-orogenic environments, noble metals, non-metallic, ferrous, non-ferrous, radioactive, rare metals of Kazakhstan.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Maximum marks by the tasks types	
Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

| Reading list | [1] Starostin V. I. Metallogeniya. M. : KDU, 2012. [4]Kunts A.F., Metallogeny. Syktyvkar, 2003
[2] Abdulin A.A. Mineral resources of Kazakhstan
Almaty 1983
[5]Krivtsov A. I. Applied metallogeny. M.:
Nedra, 1989
[3] Shcherba G.N. Essays on metallogeny
Kazakhstan.Almaty , 1981
[6]Metallogeny of Kazakhstan. Ore formations (in
separate volumes by types of minerals).
Publishing house "Science" Kazakh SSR. 1976-1980 |

Module designation	GEO211 Geology of ore-bearing regions
Semester(s) in which the module is taught	1st semestr (autumn)
Person responsible for the module	Kembayev Maksat Kenzhebekuly
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	- GEO 115 General Geology
Module objectives / intended learning outcomes	The main goal of the course is to familiarize future surveyors and geologists-prospectors with the geological structure of Kazakhstan, the principles of zoning, the main material complexes of rocks that determine the "face" of the main structural elements of the earth's crust in Kazakhstan, the history of their development and metallogenic specialization.
Content	Regional geological and geophysical research (RGI) and geological survey work at the present stage (content, objectives, scale, mandatory methods, etc.). Elements of geological maps of various types. Types of regionalization and tasks. Definitions of the most important mining regions of Kazakhstan. Geodynamic settings of the most important mining regions of Kazakhstan and an assessment of their prospects at the present stage of study.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: • accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) • creativity and creativity (T) - 30% (how and how the work is presented) • completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) • originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.

Requirements for training and exams	Maximum marks by the task s types	
	Tests and activity	4 points = 8
	Student's independent work	6 works 4 points = 24
	1st intermediate certification (Midterm)	M-1: 10 points=10
	Independent student work (IWS)	2 IWS 4 points=8
	2nd final certification (Endterm)	M-2: 10 points=10
	Final exam	40
	Total	**100**

| Reading list | 1. Baibatsha A.B. Geology of mineral deposits, 2018. – 430 p. *
2. Yazikov V.G., Petrov N.I. et al. Shu-Sarysu depression – a new potential province of rare metal mineralization // Geology and mineral resources of Kazakhstan Almaty: Kazgeo, 2000. pp. 187-196*
3. Abdulin A.A. Geology and mineral resources of Kazakhstan. – Almaty: Gylym, 1994. *
4. Miroshnichenko L.A., Zhukov N.M., Bespaev H.A., etc. Mineragenic map of Kazakhstan // Geology Kazakhstan. 2001. No.3-4, pp. 73-85*
5. Abdulin A.A. Geology of Kazakhstan. – Almaty:Science, 1981. *
6. Geology and metallogeny of Karatau. 1-2 t. A-Ata, Science, 1986, Vol.1, Geology. 240 p. *
7. Abdulin A.A., Patalakha E.I. Geodynamics The Earth's crust of Kazakhstan. – Alma-Ata: "Science" of the Kazakh SSR, 1980. – 176 p. * |

Module designation	GEO2142 Geophysical research of wells
Semester(s) in which the module is taught	1st semestr (autumn)
Person responsible for the module	Istekova A. S., Isagalieva A. K.
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	Know: theoretical foundations of geophysical methods; relationships between petrophysical parameters and observed geophysical fields in the well; methods of geological interpretation of well logging data; rational integration of geophysical methods depending on geological and technical conditions and set practical tasks. Be able to: conduct well logging using various geophysical methods; - to interpret the results of processing the observed data
Module objectives / intended learning outcomes	Within the course, the master's student will master the analysis of modern basic geophysical methods of well research, their informativeness and integration; -physical foundations and corresponding limitations of modern geophysical methods of well research; - the main aspects of metrological support and measurement accuracy of various geophysical methods; -to give a description of the features of the interpretation of logging diagrams in various types of geological sections.
Content	1. GIS procedures and presentation of materials 2. Tasks of geophysical research in wells 3. Classification of GIS methods and complexes 4. Factors complicating GIS data 5. The main stages of interpretation of GIS data
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) creativity and creativity (T) - 30% (how and how the work is presented) completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Maximum marks by the tasks types	
Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

| Reading list | [1] Skovorodnikov I.G. Geophysical studies of wells: A course of lectures. - Yekaterinburg: UGGA, 2014. - 294 p
[2] Borisenko G.T. "Complex interpretation of GIS materials". exploration of MPI"). KazNITU, 2014 – p.
[3] Koskov, V. N. Geophysical studies of wells and interpretation of GIS data: textbook. manual / V. N. Koskov,
B. V. Koskov. – Perm: Publishing house of Perm. state. tech. un-ta, 2007. – 317 p.
[4] Latyshova M.G. Practical guide on the interpretation of diagrams of geophysical methods of well research. M.: Nedra,1981., 2007.
[5] Borisenko G.T., Akhmetov E.M. Geophysical research methods in ore and coal wells. Studies. stipend. - Almaty: KazNTU nm. K.I. Satpayev, 2014. - 276 p. |

Module designation	**GEO483 Actual problems of modern subsoil use**
Semester(s) in which the module is taught	2nd semestr(spring)
Person responsible for the module	Mustapayeva S. N.
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	Learn from the left yat project 's contracts and licenses th at all kinds of mining operations on all types of mineral resources, work programs for exploration projects, search, evaluation, exploration plans, production, use of mineral resources and space to prospect for gold. Will be able to left yat project s geological study sites, exploration and production, as well as sites for the use of subsoil and to prospect for gold.
Module objectives / intended learning outcomes	The a quesition of the necessary knowledge , skills and abilities for qualified geological support and support of the subsoil use process (all types of subsoil use operations: geological exploration of the subsoil, exploration, production, use of the subsurface space and mining).
Content	Features of subsoil use in Kazakhstan. Analysis of modern subsoil use, taking into account the nation's execution plan (74 and 75 steps) and Kazakhstan's transition to international standards and rules in the field of studying and using subsoil. Studying the legislation on subsoil and subsoil use of the Republic of Kazakhstan and its regulatory legal acts, other laws of the Republic of Kazakhstan related to subsoil use and literature devoted to the problems of subsoil use.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Maximum marks by the tasks types	
Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

Reading list	1 Прозоровский В.А. Общая стратиграфия.Учебник для вузов «Академия», Москва, 2010 г., 208 стр., 2. Международная стратиграфическая шкала докембрия и фанерозоя: принципы построения и текущего состояния. TN Root. - Санкт-Петербург: Издательство ВСЕГЕИ, 2009. - 40 с. 3. Янин Б.Т. Палеобиогеография : учебник для студ. высш. учеб. заведений. М.: Издательский центр «Академия», 2009. 256 с. 4. Стратиграфический код России. Третье издание. СПб.: Издательство ВСЕГЕИ, 2006. 96 с. (Межведомственный стратиграфический комитет России, ВСЕГЕИ). 5. Вангенгейм Э. А. Эволюция взглядов на стратиграфические схемы квартера по работам Геологического института РАН // Стратиграфия. Геол. корреляция. 2010. Т. 18. № 6. – С. 118–128.

Module designation	GEO484 Petrogenic minerals
Semester(s) in which the module is taught	2nd semestr (autumn)
Person responsible for the module	Bekbotaeva A.A.
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	To have skills: research and determination of petrogenic minerals using a polarizing microscope.
Module objectives / intended learning outcomes	is to give undergraduates knowledge about the patterns of propagation of light waves in a crystalline medium and to teach the ability to determine rock-forming minerals using a polarizing microscope.
Content	Refraction of light in minerals and related optical effects observed under a microscope; birefringence and optical indicatrix of minerals of various syngonies and the related optical properties of minerals; the passage of light in a polarizing microscope; conoscopic method for determining the optical axis, sign and angle of the optical axes of minerals; immersion method for determining the refractive indices of minerals; investigation and determination by the optical property of petrogenic minerals of igneous, sedimentary, metamorphic and metasomatic rocks using a polarizing microscope.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Maximum marks by the tasks types	
Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

Reading list	1. Bekbotaev A.T., Bekbotaeva A.A. Microscopy of petrogenic minerals. Almaty: Evero. 2017. 2. Bekbotaev A.T., Imanbayeva N.F. Igneous rocks. Methodological guidelines for laboratory classes. Almaty: KazNTU. 2004-27c. 3. Michael M. Raith, Peter Krause& Jürgen Reinhardt. Guide to Thin Section Microscopy. Publisher: Raith, Ras & Reinhardt. Language: English. p. 127. Isbn-13: 9783000376719. Publish date: 2012-02-xx. Edition 4. Belousova O.N., Mikhina V.V. General course of petrography. M., "Nedra", 1982

Module designation	HUM210 History and philosophy of science
Semester(s) in which the module is taught	2nd semestr(spring)
Person responsible for the module	Anasova K.T., Mendyvayev
Language	Russian, Kazakh
Relation to curriculum	Basic
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	4 credits: contact - 2 (lecture - 1 credit, practice - 1 credits), contactless - 2 credits (SROP, SRO)
Required and recommended prerequisites for joining the module	To know and understand the philosophical issues of science, the main historical stages of the development of science, the leading concepts of the philosophy of science, to be able to critically evaluate and analyze scientific and philosophical problems, to understand the specifics of engineering science, to have the skills of analytical thinking and philosophical reflection, to be able to substantiate and defend one's position, to own techniques conducting discussions and dialogue, master the skills of communicative and creative in their professional activities
Module objectives / intended learning outcomes	- knowledge of the history of Science and philosophy; familiarization with the main theoretical problems of philosophy; the ability to think logically and creatively, to prove their position.
Content	Within the framework of the course, the master's student will master the practical application of the philosophical and methodological content of Science, the worldview, social and cultural significance and functions of Science, the historical experience of scientific and engineering-technical knowledge. Basic knowledge and skills in the field of history and philosophy of science, as well as methods of philosophical and methodological identification, analysis and evaluation of problematic issues of scientific research will be proposed.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: - accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) - creativity and creativity (T) - 30% (how and how the work is presented) - completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) - originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Maximum marks by the tasks types	
Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

Reading list	1. "history and philosophy of Science" zh. a. Altaev, N. zh. Baitenova T. B. rarity 2009. 2. Altaev zh.a.history and philosophy of Science. Updated and edited. - Evero 2011. - 468 pages. 3. Kohanovsky V. P. philosophy and methodology of science. Rostov-on-Don,1999 4.philosophy and methodology of science. For postgraduates and undergraduates / sub. Ed. K. H. Rakhmatullina and Dr. Almaty, 1999 5.Ndzharova Sh. A., Zaurbekova L. R. history and philosophy of Science: textbook – 2nd edition / Kazakh National Agrarian University. Almaty, 2010. - 189 P. 6. Khasanov M. Sh., Petrova V. F. history and philosophy of science. Almaty, Kazakh University, 2013.

Module designation	GEO485 Genesis of the main industrial deposits
Semester(s) in which the module is taught	2nd semestr(spring)
Person responsible for the module	Bekmukhametova Zaure Arstanovna
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	Have the skills to analyze the geological, tectonic map, stratigraphic column, based on a comprehensive analysis, be able to recreate and describe the genesis of industrial types of deposits.
Module objectives / intended learning outcomes	The aim of the course is to study the theory of the formation of deposits of various types of minerals and proposed models of formation. Objectives of the discipline: familiarity with existing ideas about the conditions for the formation of minerals; the study of individual atypical forms of ore deposits; mastering the basic principles of the theory of magmatism, metallogeny and ore formation; study of the mechanism of formation of igneous deposits; the study of the mechanism of formation of metamorphic deposits; theory of the formation of groundwater and oil and gas fields.
Content	Pyrite deposits of the world, pyrite-bearing provinces, ore regions and nodes, typical deposits. Classification of genetic types: Cypriot, Uralic, Brazilian type, the theory of their formation. Features of the formation of gold deposits in Kazakhstan. Spatio-temporal paragenetic relationship of uranium and gold deposits, models of their formation. Uranium deposits, iron ore, copper deposits of Kazakhstan, their world analogues and the theory of their formation.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: . accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) . creativity and creativity (T) - 30% (how and how the work is presented) . completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) . originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types** | Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**	
Reading list	1. V.A. Ermolov, G.B.Popova and others. Mineral deposits: studies. for universities; Moscow State Horn. un-T. - 5th ed., ster. - M.: MGSU, 2013. - 570 p. 2. Starostin V.I., Ignatov P.A. Geology of minerals : Textbook for universities; Lomonosov Moscow State University. - M. : Akad. project: Mir, 2006. - 512 p. 3. Smirnov V.I. Geology of minerals. - M.: Nedra, 1989. 326 p. 4. Kuznetsov Vitaly Germanovich.Lithology. Sedimentary rocks and their study : Textbook for universities / M.: Nedra, 2007. - 511 p. 5. V.V. Avdonin, V.I.Starostin Geology of minerals. M: Publishing Center "Academy", 2010. 385 p. 6. A.E. Koveshnikov. Geology of oil and gas. Textbook / Tomsk: Publishing House of Tomsk Polytechnic University, 2011. – 168 p.

Module designation	**HUM209 Higher school pedagogy**
Semester(s) in which the module is taught	2nd semestr(spring)
Person responsible for the module	Zykova Natalia Mikhailovna
Language	Russian
Relation to curriculum	Required component Basic discipline
Teaching methods	lecture, practical classes, SRO, SROP
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits (SROP, SRO)
Required and recommended prerequisites for joining the module	The purpose of the Psychology module is to form a social and humanitarian worldview among students, expand their horizons, and increase the general culture and education of students. As a result of completing the course, students will be able to: - use methods of obtaining psychological information; - apply psychological knowledge to solve professional problems; - think critically; - explain the nature of situations in the field of social communication; - be able to find ways to solve conflict situations in society; - correctly express and reasonably defend their own position; - to know and assume your own identity.
Module objectives / intended learning outcomes	The course is for students in all undergraduate majors. The course is unique and innovative in terms of content and material delivery. It contains elements of interactive interaction with students in the process of reading lecture material, as well as practical classes. The course includes sections: an introduction to psychology. Me and my motivation. Emotions and emotional intelligence. Human will and the psychology of self-regulation. Individual-typological personality features. Values, interests, norms as the spiritual basis of the individual. Psychology of the meaning of life and professional self-determination. Personality health psychology. Communication of individuals and groups. Perceptual side of communication. Interactive side of communication. Communicative side of communication. Concept and structure of socio-psychological conflict. Patterns of personality behavior in conflict. Techniques and techniques for effective communication
Content	Various teaching methods and technologies are used in the classes: student-centered training, competence-oriented training, role-playing games and educational discussions of various formats, case stadiums (analysis of specific situations), project method (development and transformation of own experience and competence)
Examination forms	Examination cards
Study and examination requirements	- Availability of computer and computer equipment; - Availability of Internet channel with speed of at least 0.5 Mbit/s; - A personal account with a face photo on an avatar and corporate mail on the Microsoft 365 platform; - Attending classes according to the schedule.
Reading list	Dzhakupov S.M. «Introduction to general psychology». - A.: Kazakh University, 2014y. Ilyin E.P. «Psychology of communication and interpersonal relations». - St. Petersburg: Peter, 2009. - 576 s. silt. - (Masters of Psychology, series). Maklakov A.G. «General Psychology». Textbook for universities. Moscow: Yurite, 2018. Maslow A. «Motivation and Personality». - St. Petersburg: 2008. – 352 pages. Grishina N.V. «Psychology of Conflict». st. Petersburg: 2008. - 464 p. silt. - (Masters of Psychology, series). Efimova N.S. «Social Psychology». - Moscow: Yurite, 2017. E.P. Ilyin. «Psychology of creativity, creativity, endowments». - St. Petersburg, 2011. – 448 pages. Vinogradova, S. M. «Psychology of Mass Communication»: textbook/S. M. Vinogradova, G.S. Melnik. - Moscow: Yurite, 2014. – 512 pages.

Module designation	**GEO231 Fundamentals of Petrology**
Semester(s) in which the module is taught	3rd semestr(autumn)
Person responsible for the module	Omarova G.M.
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	Basics of Petrology history, subject, tasks and methods of studying crystalline matter; fundamentals of mineralogy and methods for the determination of uranium minerals (physical, morphological) and their classification; possession of fundamental knowledge in the field of uranium geology and related disciplines at a high level;
Module objectives / intended learning outcomes	Bost endogenous deposits are closely associated with igneous rocks, and they themselves are often the minerals. Therefore, for undergraduates in the specialty "Geology and Exploration of the MPI", the main purpose of studying this discipline is to obtain knowledge about the composition, structure, conditions of formation of magmatites and the relationship of mineral deposits with them.
Content	Current data on magmas and their origin: physicochemical principles of crystallization of magmatic melts; the main causes of the diversity of magmatites; chemical and mineral composition, structures of magmatites and their genetic significance; rocks of ultramafic, basic middle, acid, foid composition and their types, varieties, conditions for the formation and connection with it of mineral deposits; their study using a polarizing microscope; igneous associations (formations) and series.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: - accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) - creativity and creativity (T) - 30% (how and how the work is presented) - completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) - originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Maximum marks by the tasks types	
Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

Reading list	1. Collection of international mining codes. YORK, VALMIN, Australian Guide to Coal Mine Assessment and Classification, 2015 2. Legal foundations of subsoil use - Baimakhanova G.A., 2007

Module designation	GEO240 Regional geology of the CIS countries
Semester(s) in which the module is taught	3rd semestr(spring)
Person responsible for the module	Asubayeva Saltanat Kalykbayevna
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	Have the skills to: analyze, compare the geological data of one territory with another, reproduce the history of the geological development of the region and identify structures and related types of mineral deposits. Be able to: analyze the tectonic map and the map of tectonic zoning.
Module objectives / intended learning outcomes	Familiarization with the features of the geological structure, the history of geological development, patterns of distribution of mineral deposits and their geological position in the earth's crust of the vast territory occupied by the countries of the near abroad (CIS and Baltic States).
Content	Fundamentals of tectonic zoning of the territory of the CIS and Baltic countries. Ancient platforms: Eastern European platform, Siberian platform. The folded region of the Ural-Mongolian belt: Ural-Novaya Zemlya folded area, Southern Tien-Shan. Kazakh-Kyrgyz folded region, Zaisan folded system, Altai-Sayan folded region, Sayan-Yenisei folded region. The Baikal region and Transbaikalia. Taimyr-Severozemelskaya area. Young epipleoneura plates of Eurasia: Scythian and the Turan plate, Western-Siberian plate. Areas of the Mediterranean zone of the Cenozoic (Alpine) folding within Europe: the Eastern Carpathians and the Mountainous Crimea, the Caucasus mountain region. Region of the Mediterranean belt in the Cenozoic (Alpine) folding within Asia, the Kopet Dagh and Pamir. Region of the Pacific belt of Mesozoic and Cenozoic (Alpine) folding: Verkhoyansk-Chukotsk and the Kamchatka-Koryak region. Areas of the Pacific belt of the Cenozoic (Alpine) folding: the Mongol-Okhotsk, Sikhote-Alin and Sakhalin folding areas of the Far East of Russia. Kuril and Commander islands.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	<table><tr><td colspan="2">Maximum marks by the tasks types</td></tr><tr><td>Tests and activity</td><td>4 points = 8</td></tr><tr><td>Student's independent work</td><td>6 works 4 points = 24</td></tr><tr><td>1st intermediate certification (Midterm)</td><td>M-1: 10 points=10</td></tr><tr><td>Independent student work (IWS)</td><td>2 IWS 4 points=8</td></tr><tr><td>2nd final certification (Endterm)</td><td>M-2: 10 points=10</td></tr><tr><td>Final exam</td><td>40</td></tr><tr><td>Total</td><td>100</td></tr></table>
Reading list	1. Bogoyavlenskaya O.V., Puchkov V.N., Fedorov M.V. Geology of the USSR. Moscow, Publishing house "Nedra", 1991. 240 p. 2. Abdullin A.A. Geology and mineral resources Kazakhstan. Almaty, Publishing house "Gylym", 1994. 400 s 3. Khain V.E. General geotectonics. Moscow, Publishing House "Nedra", 1985. 4. Smirnova M.N. Fundamentals of geology of the USSR. Moscow, Higher School Publishing House, 1984.

Module designation	GEO283 Actual problems of stratigraphy
Semester(s) in which the module is taught	3rd semestr (autumn)
Person responsible for the module	Mustapayeva Sezim Nurakhmetovna
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	– perform a description of the sections with the selection of the necessary primary materials; to construct lithological-stratigraphic and biostratigraphic sections and schemes; to use lithological, geochemical data to construct complex stratigraphic scales of various scales; to present the results of the conducted research in oral and written form
Module objectives / intended learning outcomes	The acquisition of the necessary knowledge , skills and abilities for qualified geological support and support of the subsoil use process (all types of subsoil use operations: geological exploration of the subsoil, exploration, production, use of the subsurface space and mining).
Content	As part of the course, undergraduates will learn to participate in the interpretation of geological information, the preparation of reports, abstracts, bibliographies on the subject of scientific research, in the preparation of publications. The basic knowledge and skills in the field of stratigraphy, biostratigraphy and paleontology will be presented; about the spatial and temporal patterns of sedimentary rock placement; the dependence of the characteristics of sedimentary and volcanogenic-sedimentary formations on tectonic, climatic, paleogeographic conditions of formation on the territory of Kazakhstan; about the basics the evolutionary theory of the development of the organic world; about the factors that controlled the distribution of ancient organisms in the external environment;
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) creativity and creativity (T) - 30% (how and how the work is presented) completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**	
	Tests and activity	4 points = 8
	Student's independent work	6 works 4 points = 24
	1st interme iate certification (Midterm)	M-1: 10 points=10
	Independent student work (IWS)	2 IWS 4 points=8
	2nd final certification (Endterm)	M-2: 10 points=10
	Final exam	40
	Total	**100**

Reading list	1 Prozorovsky V.A. General stratigraphy.Textbook 3for universities "Academy", Moscow, 2010, 208 p., 2. International stratigraphic scale of the Precambrian and Phanerozoic: principles of construction and current state. TN Root. - Saint Petersburg: VSEGEI Publishing House, 2009. - 40 p. 3. Yanin B.T. Paleobiogeography : textbook for students. higher. studies. institutions. M.: Publishing Center "Academy", 2009. 256 p. 4. Stratigraphic code of Russia. Third edition. St. Petersburg: VSEGEI Publishing House, 2006. 96 p. (Interdepartmental Stratigraphic Committee Russia, VSEGEI). 5. Kholmova G.V., Ratnikov V.Yu., Shpulyu V.G. Theoretical foundations and methods of stratigraphy. Educational and methodical manual for universities. Publishing and Printing Center Voronezh State University, 2008.- 154 p .

Module designation	GEO 223 Methods of lithological research
Semester(s) in which the module is taught	3rd semestr (autumn)
Person responsible for the module	Mustapayeva Sezim Nurakhmetovna
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	- petrography Genesis. To be able to document the sedimentary sequence, to describe the lithological sections, to reconstruct on the basis of the observations of the conditions of their formation and transformation. Have skills: graphical representation and geological interpretation of lithological data.
Module objectives / intended learning outcomes	Familiarization of students with the systematics of sedimentary rocks; methods of petrographic studies of sedimentary rocks; processes of lithogenesis, diagenesis, catagenesis and metagenesis. The General objectives of the discipline are: to study the petrography of sedimentary rocks, their accumulation processes and post-sedimentary changes; to study methods for studying sedimentary rocks; to study methods for describing sedimentary sections, constructing lithological columns and profiles, and ways to interpret them; to study methods for constructing lithological and paleogeographic maps.
Content	Fundamentals of the theory of lithogenesis: hypergenesis, its factors, features of weathering in various climatic zones. Sedimentation: characteristics of transport and accumulation of sediments, sedimentary differentiation. The diagenesis of sediments. Catagenesis, compaction of sedimentary rocks and processes of mineral formation. Sedimentary facies and their types; features of sedimentary rocks of various facies. Methods of facies analysis: lithological, study of organic remains, study of the form of occurrence and structure of sedimentary rocks and their relationship with surrounding formations, methods of facies mapping.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) creativity and creativity (T) - 30% (how and how the work is presented) completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**	
	Tests and activity	4 points = 8
	Student's independent work	6 works 4 points = 24
	1st intermediate certification (Midterm)	M-1: 10 points=10
	Independent student work (IWS)	2 IWS 4 points=8
	2nd final certification (Endterm)	M-2: 10 points=10
	Final exam	40
	Total	**100**
Reading list	[1] Yapaskurt O.V. Litology textbook – M.: Academy, 2008 [2] Alekseev V.P. Lithological studies – Yekaterinburg, 2006. – 260s. [3] Yezhova A.V. Litology textbook: Tomsk, 2005. [4] Fortunatova N.K. Atlas of structural components of carbonate rocks Moscow, 2005. [5] Maslov A.V. Sedimentary rocks methods of study and interpretation of the data obtained, Yekaterinburg, 2005. [6] Proshlyakov B.K., Kuznetsov V.G. Lithology. Textbook. – M.: Nedra, 1991

Module designation	**GEO706 Fundamentals of ecological geology**
Semester(s) in which the module is taught	3rd semestr (autumn)
Person responsible for the module	Zhunusov Akylbek Asyrakulovich
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	- GEO 115 General geology Know: basic concepts, object, subject and tasks of ecological geology, the ratio of ecological geology and geoecology, ecological functions of the lithosphere, types of lithological systems and their ecological functions, criteria for assessing the current state of ecosystems, methodological foundations of ecological geology, the system of ecological and geological monitoring and methods of ecological and geological mapping, the content of engineering and environmental surveys, the role of environmental geology in the justification of environmental management.
Module objectives / intended learning outcomes	The main goal of the course is to solve morphological problems related to the study of the composition, state, structure and properties of the analyzed system, its ecological and geological conditions as a whole. Retrospective tasks related to the study (or rather restoration) of the history of the formation of the object of research, the formation of its modern quality. Forecast tasks related to the study of the structure and development trends of the system under study in the future under the influence of various causes of natural and man-made origin
Content	Familiarization with the ecological functions of the lithosphere and the whole complex of environmental problems. Morphological, retrospective, and predictive tasks are solved. Theoretical basis of ecological Geology. Criteria for assessing the current state of ecosystems. Ecological, resource, ecological, geodynamic, geochemical functions of the lithosphere.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Maximum marks by the tasks types	
Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

Reading list	. Theory and methodology of ecological geology /Ed.T.Trofimova - M.,1997. 2. Trofimov V.T., Ziling D.G. Theoretical and methodological foundations ecological geology. Study guide. St. Petersburg, 2000. 3. Trofimov V.T., Ziling D.G. Ecological geology. - M.: Geoinformmark, 2002. 4. Ecological functions of the lithosphere /Edited by V.T.Trofimov - M., 2000. 5. Alekseenko V.A., Ecological geochemistry. - M., 2000. 6.Bogoslovsky V.A., Zhigalin A.D., Khmelevsky V.K. Ecological geophysics. — M., 2000. 7.Radiation safety standards (NRB-99).

Module designation	**GEO704 Interpretation of geological and geophysical data for the purposes of calculating oil and gas reserves and resources**
Semester(s) in which the module is taught	1st semestr (autumn)
Person responsible for the module	Zholtayev G. Zh.
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	3 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	- Lithology - Geodynamics of gas-bearing basins - Geology of oil and gas
Module objectives / intended learning outcomes	- study of the current state of interpretation of geological and geophysical data from the point of view of determining the parameters of deposits for calculating the reserves of oil and gas fields and subsequent monitoring of the development of these fields; - teaching students the skills of processing geological and geophysical information to solve geological problems;
Content	Description of works: - solve geological problems available to geophysical methods; - evaluate the capabilities of each method and complex of geophysical methods for solving certain geological problems; - be able to analyze the results of geophysical materials; - analyze the results of geophysical research; - to draw conclusions about the structure and composition of the rocks composing the geological section; - use geophysical materials to determine the state of the real geological environment.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**	
	Tests and activity	4 points = 8
	Student's independent work	6 works 4 points = 24
	1st intermediate certification (Midterm)	M-1: 10 points=10
	Independent student work (IWS)	2 IWS 4 points=8
	2nd final certification (Endterm)	M-2: 10 points=10
	Final exam	40
	Total	**100**
Reading list	1. Geophysical research methods: A textbook for universities / V.K. Khmelevsky, M.G. Popov, A.V. Kalinin, etc. – M.: Nedra, 1988. – 396s. 2. Dakhnov V.N. Interpretation of the results of geophysical studies of well sections. – M.: Nedra, 1982. – 448s. 3. Dyakonov D.I., Leontiev E.I., Kuznetsov G.S. General course of geophysical studies of wells. – M.: Nedra, 1984. – 432s. 4. Yezhova A.V. Geological interpretation of geophysical data: Textbook. – Tomsk, TPU Publishing House, 2009. – 114 p. 5. Interpretation of the results of geophysical studies of oil and gas wells: Handbook / Edited by V.M. Dobrynin. – M.: Nedra, 1988. – 476s.

Module designation	**GEO742 Aerospace methods in the search for oil and gas fields**
Semester(s) in which the module is taught	1st semestr (autumn)
Person responsible for the module	Zholtayev G. Zh.
Language	Russian
Relation to curriculum	The cycle of basic disciplines (B) is a compulsory discipline
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	3 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	The student must be able to: - To carry out the construction of the simplest geological graphics using graphic editors - Visualize and interpret aero and space images; - Decryption and analysis of images
Module objectives / intended learning outcomes	The purpose of teaching the discipline "Aerospace methods in the search for oil and gas fields" is to gain knowledge about the principles of application aerospace methods in oil and gas geology in the search for oil and gas deposits, familiarization with the methods of oil and gas geological interpretation in various geographical and geological conditions.
Content	As part of the course, the student will master skills in working with aero and space images of the Earth's surface, decoding and analyzing images as sources of information reflecting the structure of the subsurface, which are the object of geological searches and the receptacle of accumulations of oil and gas. Basic knowledge and skills in the field of oil and gas geology, as well as methods in the search for oil and gas fields will be presented.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

Reading list	1. Aerospace methods in geology Collection of scientific articles Issue 2 Under the general editorship of I. S. Kopylov Perm 2020, 320 p. 2 Ananyev Yu.S., Zhitkov V.G., Potseluyev A.A., Remote methods of geological research, forecasting and prospecting of mineral deposits STT, Tomsk, 2012, 304 p., UDC: 55:5504.064 (07), ISBN: 978-5-4387-0070-8 3. D.M. Trofimov, M.D. Karger, M.K. Shuvaeva Remote sensing methods in the exploration and development of oil and gas fields,Infra-Engineering, Moscow, 2015, 80 p.

Module designation	GEO299 Oil and gas hydrogeology
Semester(s) in which the module is taught	2nd semestr (spring)
Person responsible for the module	Jarasova T. S.
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	- Lithology - Geodynamics of gas-bearing basins - Geology of oil and gas
Module objectives / intended learning outcomes	- study of the current state of interpretation of geological and geophysical data from the point of view of determining the parameters of deposits for calculating the reserves of oil and gas fields and subsequent monitoring of the development of these fields; - teaching students the skills of processing geological and geophysical information to solve geological problems;
Content	Training of specialists in the modern theory of organic geochemistry within the sedimentary basin as a whole or a separate structural floor, types of organic matter, conditions of sedimentogenesis and its subsequent burial, determination of the source of oil and gas, their accumulation zones, directions of oil and gas migration, determination of patterns of distribution of oil and gas mother and oil and gas accumulating strata, assessment of resources and reserves in preparation for exploitation of oil and gas fields, increasing efficiency studies of sedimentary basins to identify promising areas for oil and gas.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Maximum marks by the tasks types	
Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

Reading list	1. Regional modeling of basins of various geodynamic types in connection with the forecast of their oil and gas potential. Malysheva S.V. St. Petersburg, 2015, 137p 2.Sedimentary basins: methods of study, structure and evolution. (Edited by Yu.G.Leonov,Yu.A.Volozha). - M.: Scientific world, 2004. - 526 p. Color tab - 40 cm. 2. Geology and geochemistry of oil and gas [Electronic resource] : textbook / E. E. Kozhevnikova ; Perm State National Research University. – Electronic data. – Perm, 2020. – 2.25 MB ;90 p . 5. Paleogeothermal placement criteria oil deposits. Ammosov I.I., V.I.Gorshkov, Grechishnikov N.P., Kalmykov G.S. M., "Nedra", 1977, 156s. 3. Yezhova, A.V. Lithology: textbook for applied bachelor's degree / A.V. Yezhova. — Moscow : Yurayt Publishing House, 2016. — 101 p.

Module designation	GEO263 Analysis of sedimentary basins
Semester(s) in which the module is taught	2nd semestr (spring)
Person responsible for the module	Uzbekgaliev R.H.
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	3 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	- identify homogeneous geological bodies, reconstruct the conditions of their formation and determine lateral changes in their structure to predict the structure of natural reservoirs in the search, exploration and exploitation of various deposits;
Module objectives / intended learning outcomes	- the student must demonstrate the ability to analyze and summarize the data of modern publications and discoveries, read the tectonic map and have the skills to conduct paleotectonic analysis.
Content	As part of the course, the student will master the practical use of fundamental theoretical concepts about the regularities of the formation of sedimentary basins (OB) in the Earth's lithosphere, as well as different-scale tectonic structures, methods of mapping them, purposes and methods of their modeling, restoration of the history of the development of OB and its role in the formation, distribution of hydrocarbon accumulations. The basic knowledge and skills in the field of geotectonics and geodynamics of oil and gas areas will be presented. Development of methods of structural and tectonic analysis and forecast of oil and gas potential.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**	
	Tests and activity	4 points = 8
	Student's independent work	6 works 4 points = 24
	1st intermediate certification (Midterm)	M-1: 10 points=10
	Independent student work (IWS)	2 IWS 4 points=8
	2nd final certification (Endterm)	M-2: 10 points=10
	Final exam	40
	Total	**100**
Reading list	1. Maslov A.V., Alekseev V.B. Sedimentary formations and sedimentary basins: textbook.stipend. – Yekaterinburg: UGGA, 2003. – 203 s 2. Nikishin A.M.Global geodynamics. Moscow 2014. 3. Nikishin A.M. Types of sedimentary basins. Presentations

Module designation	**GEO743 Lithology of natural oil and gas reservoirs**
Semester(s) in which the module is taught	2nd semestr (spring)
Person responsible for the module	Ensepbayev Talgat Ablaevich
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	3 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits 5 (2/0/1/2)
Required and recommended prerequisites for joining the module	-to know the types of sedimentary rocks, the stages of formation and transformation of sedimentary rocks, the most common natural reservoirs, the causes of deposition of matter, sedimentation textures, sedimentary rock structures. -know the concept of facies -possess methods of geological and lithological research
Module objectives / intended learning outcomes	- the student must demonstrate the ability to analyze and summarize the data of modern publications and discoveries, read the tectonic map and have the skills to conduct paleotectonic analysis.
Content	As part of the course "Lithology of natural oil and gas reservoirs", the student will master the classification of sedimentary rocks, types of lithogenesis, methods of lithological studies of rocks, the main stages of formation and transformation of sedimentary rocks, definitions and descriptions of the composition, structure and texture of rocks, generalize analytical data.
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**	
	Tests and activity	4 points = 8
	Student's independent work	6 works 4 points = 24
	1st intermediate certification (Midterm)	M-1: 10 points=10
	Independent student work (IWS)	2 IWS 4 points=8
	2nd final certification (Endterm)	M-2: 10 points=10
	Final exam	40
	Total	**100**
Reading list	1. Kuznetsov Vitaly Germanovich, Lithology. Fundamentals of general (theoretical) lithology Textbook for universities. - M.: Scientific world, 2011. - 360 p. 2. Proshlyakov B.K., Kuznetsov V.G. Lithology: Textbook for universities M.: Nedra, 1991. – 444 p. 2. Proshlyakov B.K., Kuznetsov V.G. Lithology and lithological-facies analysis. – M., Nedra, 1981. – 284 p. 3. Pettijohn F. J. Sedimentary rocks. M., Mir, 1981. 751 p. 5. Alekseev V.P. Lithology: A textbook. – Yekaterinburg: UGGA Publishing House, 2001. – 249 p. 6. Yezhova A.V. Lithology. Educational stipend. – Tomsk, TPU, 2005. -353 p. 21. Karogodin Yu.N. Introduction to petroleum litmology.

Module designation	GEO745 Sedimentation and facies conditions during the formation of oil and gas bearing
Semester(s) in which the module is taught	3rd semestr (autumn)
Person responsible for the module	Nigmatova Saida Arapovna
Language	Russian
Relation to curriculum	Elective courses
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture-15h, practical classes - 30h. SRO (including SROP) - 105 hours
Credit points	3 credits: contact - 2 (lecture - 1 credit, practice - 2 credits), contactless - 2 credits
Required and recommended prerequisites for joining the module	-to know the types of sedimentary rocks, the stages of formation and transformation of sedimentary rocks, the most common natural reservoirs, the causes of deposition of matter, sedimentation textures, sedimentary rock structures. -know the concept of facies -possess methods of geological and lithological research
Module objectives / intended learning outcomes	During lectures and practical classes , undergraduates will get acquainted with the types of facies, the conditions of sediment transfer and accumulation, learn how to determine the types of facies by core or sections, describe cores or sections, make a geological column, get acquainted with the principles of compilation lithofacial and paleogeographic maps.
Content	Formation of students' knowledge and competencies in the field of lithological features of various facies, their classification, main features and determination of conditions conducive to the accumulation of oil and gas deposits. In the course of studying the subject, students must master the following concepts and skills: - Know the characteristics of the main facies (marine, continental, transitional), be able to determine (macroscopic and microscopic) and structures and textures of rocks, be able to describe rocks using basic criteria (color, density, hardness, type of layering, etc.); - have an idea of the genetic and spatial relationship of various sedimentary rocks
Examination forms	Each work, except for tests, is evaluated according to 4 criteria: · accuracy and accuracy (A) - 30% (how accurately and accurately the work is calculated) · creativity and creativity (T) - 30% (how and how the work is presented) · completeness and maturity (H) - 40% (how deeply, logically and structurally the work was solved) · originality (O) - a special coefficient is used 1.0; 0.5 or 0 The null version of the exam (a ticket of 3 questions) is provided before the exams.
Requirements for training and exams	**Maximum marks by the tasks types**

Maximum marks by the tasks types	
Tests and activity	4 points = 8
Student's independent work	6 works 4 points = 24
1st intermediate certification (Midterm)	M-1: 10 points=10
Independent student work (IWS)	2 IWS 4 points=8
2nd final certification (Endterm)	M-2: 10 points=10
Final exam	40
Total	**100**

Reading list	1. reinek G.-E., Singh I. B. Conditions of terrigenous sedimentation (with consideration of terrigenous clastic sediments). Translated from English M.: Nedra, 1981. 439 p 2. Frolov V. T. Lithology. M. MSU. Volume 1 – 1992, Volume 2 –1993. 3. Karpyshev V.S. Lithofacial analysis. IGU, Irkutsk, 1987. 4. Nikitin I.F., Zhamoida A.I. Practical stratigraphy. Development of the stratigraphic base of large—scale geological survey works. L.: Nedra,1984.- 320 p. 5.Volkova A.N., Ivanova N.V., Krasheninnikov G.F. The doctrine of facies with the basics of lithology. Guide to laboratory classes Publishing House of Moscow State University, Moscow,1988, 214 p. 6. Yakushova A. F., Khain V. E., Slavin V. I. General geology / Edited by V. E. Khain. — M.: Publishing House of Moscow State University,1988. — 448 p.