

Description of the discipline module

Module designation	LNG108 English
Semester(s) in which the module is taught	1st and 2nd semester
Person responsible for the module	Golovchun Alevtina Anatolyevna
Language	English
Relation to curriculum	<i>Compulsory</i>
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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	Availability of the Teams platform
Module objectives / intended learning outcomes	<p>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</p> <p>Expected learning outcomes: upon completion of the module, undergraduates will know:</p> <ul style="list-style-type: none"> -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	<p>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:</p> <ul style="list-style-type: none"> - 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	<p>Oxford <i>EAP Pre-Intermediate B1</i> by Richard Storton. Oxford University Press (<i>e-version</i>)</p> <p>Harrison R. (2015) <i>Headway academic skills: listening, speaking, and study skills. Level 3, Student's book</i>. Oxford: Oxford University Press</p> <p>De Chazal E. & Rogers L. (2013) <i>Oxford EAP. A Course in English for Academic Purposes. Intermediate/ B1+</i>. Oxford: Oxford University Press</p> <p>Zemach Dorothy E. & Rumisek Lisa A. (2005). <i>Academic Writing: from paragraph to essay</i>. MACMILLAN.</p>

Module designation	LNG104 Kazakh (Russian) language
Semester(s) in which the module is taught	1,2
Person responsible for the module	Koyanbekova S.B., associate professor of KKIR; Nurmukhan A.S., tutor of KKIR a S.B., associate professor of KKIR; Nurmukhan A.S., tutor of KKIR
Language	Kazakh
Relation to curriculum	practical course
Teaching methods	practical work, independent work, independent work of a student with a teacher
Workload (incl. contact hours, self-study hours)	Practical tasks are conducted 3 times a week. Of these, 2 times – in offline format, one – online. Additionally, office hours of 30 minutes per group are held.
Credit points	5 kr: practical exercises – 3 kr., SRSP – 2 kr.
Required and recommended prerequisites for joining the module	Diagnostic testing
Module objectives / intended learning outcomes	<p>The key question is: what learning outcomes should students achieve within the module?</p> <p>As a result of mastering the discipline "Kazakh language - basic level", the student must:</p> <ul style="list-style-type: none"> - to master the practical use of reading, writing and understanding skills of sounding speech based on the simultaneous mastering of the basics of grammar (phonetics, morphology and syntax) and word usage during constant repetition with gradual complication of tasks; - demonstrate the ability to analyze, synthesize and design skills and abilities corresponding to the pan-European level B1 (Threshold according to the ALTE classification), that is, it appears on the threshold of the level of independent language proficiency; - conduct a conversation on everyday topics; describe your experiences; express your opinion; retell and evaluate the content of the book you read, the movie you saw; - create simple texts on well-known topics, including those related to professional activity.
Content	<p>The language material of the course is selected in such a way that the student, assimilating the lexical and grammatical minimum, had the opportunity to get acquainted with typical communicative situations and find himself in such situations, was able to correctly evaluate them and choose the appropriate model (strategy) of speech behavior.</p> <p>The main emphasis of learning is transferred from the process of knowledge transfer to learning the ability to use the language being studied during the implementation of various types of speech activities, which are reading (provided that the reading is understood), listening (under the same condition) and producing texts of a certain complexity with a certain degree of grammatical and lexical correctness.</p>
Examination forms	<i>Exam tickets, test questions.</i>
Study and examination requirements	<ul style="list-style-type: none"> - 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	<p>1. Kazakh language. Basic level / authors: The Purpose Of The Seminar Is To Familiarize Students With The History Of The Kazakh Language And The History Of The Kazakh Language. Astana: National Testing Center, 2016-320 pages. P 17 ISBN 978-601-7504-37-3 Electronic link: https://tilqural.kz/assets/books/0b2a5801ac721ebac75358f351c0dd33.pdf</p> <p>2. Kuzekova, G. Masakova. Kazakh language: basic level (A2): manual. - Astana: 2018. - 224 pages. Electronic link: https://tilqural.kz/assets/books/d76b6b1027365e54f79e08d1acbe3fd8.pdf</p> <p>3. Knigger-2. Learn Kazakh legko! - Almaty: School, 2011. - 192 P. vAK 80/81 66K 81.2 Kas-9</p> <p>4. Kuzekova Z. S., Ayapova T. T., Orazbayeva F. Sh., Mamaeva M. K. Level thematic lexical minimum of basic knowledge of the Kazakh language / Second Edition. - Astana: RSE "National Testing Center", 2017. – 72 pages.</p>

Module designation	KFK101-104 Physical education I, II, III, IV
Semester(s) in which the module is taught	1-4
Person responsible for the module	Imataliev T.S.
Language	Kazakh / Russian
Relation to curriculum	Compulsory
Teaching methods	Practical exercises
Workload (incl. contact hours, self-study hours)	Practical training: 240h
Credit points	8
Required and recommended prerequisites for joining the module	Physical education at the school curriculum level
Module objectives / intended learning outcomes	As part of the course, the student will master the practical use of the skills of performing the basic elements of the technique of sports and national athletics games, fitness and a set of standards for general physical training, including professionally applied physical training or one of the sports, methods of conducting independent physical exercises.
Content	OFP, athletics, volleyball, basketball, football, fitness, badminton, table tennis, PFPF.
Examination forms	Control standards for physical training
Study and examination requirements	<i>To receive a positive assessment, the student must score at least 30 points on the sum of the boundary controls, the credit – 20 points. As a result – at least 50 points, otherwise the discipline is rated "NP".</i>
Reading list	<ol style="list-style-type: none"> 1. On approval of the Rules for conducting tests of the First President of the Republic of Kazakhstan – Elbasy 2. Valeology – the science of health: Study.-method. stipend / Edited by A.D. Sokolov, Z.S. Abisheva; Kaz. gos. med. S. Zh. Asfendiyarov University. - Almaty : Gylym, 2009. - 140 p. 3. The role of physical culture and sports in the formation of a healthy lifestyle of students: Textbook / Zh. Boztaev; Almaty. technol. un-T. - Almaty: ATU, 2011. - 89 p.

Module designation	HUM100 Contemporary History of Kazakhstan
Semester(s) in which the module is taught	Autumn and spring semesters (1 and 2) for students of the 1st year of education
Person responsible for the module	Nurzhanova Aina Mardanovna
Language	Kazakh, Russian, English
Relation to curriculum	Required Component Basic discipline
Teaching methods	lecture, practical exercises, IWS, independent work of a student with a teacher
Workload (incl. contact hours, self-study hours)	150 academic hours. Lecture - 15 hours, practical classes - 30 hours. ISW (including ISW with a teacher) - 105 hours
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 2 credits), non-contact - 2 credits (ISW, including ISW with a teacher)
Required and recommended prerequisites for joining the module	The goal is to give objective historical knowledge about the main stages of the history of modern Kazakhstan; direct students' attention to the problems of the formation and development of statehood and historical and cultural processes. Tasks: - systematization of historical knowledge about the main events of modern history that form the scientific worldview and civic position; - creation of a scientifically based concept of the modern history of Kazakhstan; - creation of an ideological and spiritual basis for the consolidation of a multi-ethnic and poly-confessional Kazakh society. Learning outcomes: - knowledge of the main periods of the history of the twentieth century and independent Kazakhstan; - the ability to analyze the features and significance of the modern Kazakh model of development; - be able to substantiate the fundamental role of historical knowledge in the formation of Kazakhstani identity and patriotism; - the ability to form one's own civic position on the priorities of mutual understanding, tolerance and democratic values of modern Kazakhstani society.
Module objectives / intended learning outcomes	The course is intended for students of all undergraduate specialties. The versatility and significance of the discipline "Modern History of Kazakhstan" is due to its huge role in strengthening the Kazakh identity, self-awareness of the people, the implementation of tasks related to the need for an intellectual breakthrough in the new millennium. This course covers the period of Kazakhstan's history from the beginning of the 20th century, the Soviet period and independent Kazakhstan. During the study of the course, great importance is given to the formation of an active civic position of students. The course is aimed at the humanization of technical education.
Content	In the classroom, various technologies for the development of critical thinking are used: case studies, essay writing (Mind Map) 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 Mbps; - Personal account with a photo of the face on the avatar and corporate mail on the Microsoft 365 platform; - Attendance at scheduled classes.
Reading list	1. 1. The history of Kazakhstan (from ancient times to the present day) in five volumes. - Almaty, Atamura, 2010. 2. 2. Ayagan B., Abzhanov M.H., Seliverstov S.V., Bekenova M.S. Modern history of Kazakhstan: Textbook for students of non-historical specialties (bachelor's degree) of higher educational institutions/under the general editorship of B.G. Ayagan-Almaty: Raritet, 2010. 3. 3. Modern history of Kazakhstan: Textbook/author. A. Aunasova, A. Suleimenov. Entr.ed. B. Ayagan-Almaty, Raritet, 2010.

Module designation	HUM132 Philosophy
Semester(s) in which the module is taught	3
Person responsible for the module	Mendybaev Serik Kukaevich
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. <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ol style="list-style-type: none"> 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., Vldos, 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	MNG487 – "Fundamentals of Entrepreneurship, Leadership and Anti-Corruption Culture"
Semester(s) in which the module is taught	3
Person responsible for the module	Abenova M.H. (rus), Imankulova B.B. (kaz), Turegeldinova A.J. (English)
Language	Kazakh, Russian, English
Relation to curriculum	
Teaching methods	Lecture, seminar
Workload (incl. contact hours, self-study hours)	Total workload: 3 credits Contact hours: 1 lecture, 1 seminar
Credit points	3
Required and recommended prerequisites for joining the module	no
Module objectives / intended learning outcomes	<p>The study of the general educational discipline "Fundamentals of entrepreneurship" is aimed at achieving the following goals:</p> <ul style="list-style-type: none"> - familiarization of students with the theory and practice of entrepreneurship; - learning the basics of creating your own business; - formation of regulatory, economic and organizational knowledge and skills on the formation, organization and conduct of entrepreneurial activity. <p>To form systematic knowledge about the basics of the organization of entrepreneurial activity. Develop organizational and managerial skills in conducting business. To form knowledge about the responsibility of business entities, the student must master aesthetic concepts and categories, the content and features of professional ethics in legal activity, possible ways (methods) of resolving moral conflict situations in the professional activity of a lawyer, the essence of professional and moral deformation and ways to prevent and overcome it, the features of lawyer etiquette, its basic norms and functions; be able to evaluate the facts and phenomena of professional activity from an ethical point of view, apply moral rules and norms of behavior in specific life situations.</p> <p>As a result of mastering the discipline, the student should know:</p> <ul style="list-style-type: none"> - the typology of entrepreneurship; - the role of the environment in the development of entrepreneurship; - technology of making entrepreneurial decisions; - basic components of the internal environment of the company; - organizational and legal forms of entrepreneurial activity; - features of constituent documents; - the procedure for state registration and licensing of the enterprise; - mechanisms of functioning of the enterprise; - the essence of entrepreneurial risk and the main ways to reduce risk; - the main elements of the culture of entrepreneurship and corporate culture; - list of information subject to protection; - the nature and types of responsibility of entrepreneurs; - methods and tools of financial analysis; - basic provisions of accounting in small enterprises; - types of taxes; - a system of business performance indicators; - principles and methods of assessing the effectiveness of entrepreneurial activity; - ways to improve and control the efficiency of entrepreneurial activity. <p>Be able to: characterize the types of entrepreneurial activity and the business environment; operate in practice with economic categories; develop a business plan; prepare a package of documents for opening a business; draw up documents for opening a bank account; determine the organizational and legal form of the enterprise; develop a strategy and tactics of the enterprise; comply with professional ethics, ethical codes of the company, generally accepted rules for doing business;</p>

Content	<p>The discipline is aimed at forming students' organizational and legal form of the enterprise based on the goals of the enterprise and the specifics of the organization and functioning of enterprises in various forms; to assess the effectiveness of entrepreneurial activity; to assess external and internal risks for the enterprise; to develop business plans taking into account regulatory, resource, administrative and other conditions. Set goals and formulate tasks related to the implementation of professional functions. Organize team interaction to solve management tasks. Diagnose organizational culture, identify its strengths and weaknesses, develop proposals for its improvement. Develop measures to motivate and stimulate the organization's staff.</p> <p>Tasks of the discipline:</p> <ol style="list-style-type: none"> 1. To form systematic knowledge about the basics of the organization of entrepreneurial activity. 2. Develop organizational and managerial skills in conducting business. 3. To form knowledge about the responsibility of business entities. 4. As a result of mastering the discipline, the student must be able to: <ul style="list-style-type: none"> - to characterize the types of entrepreneurial activity and the business environment; - to operate in practical activities with economic categories; - develop a business plan; - prepare a package of documents for opening your own business; - to draw up documents for opening a current account in a bank; - determine the organizational and legal form of the enterprise; - develop the strategy and tactics of the company's activities; - comply with professional ethics, ethical codes of the company, generally accepted rules of business; - to characterize the mechanism of protection of business secrets; - distinguish the types of responsibility of entrepreneurs; - analyze the financial condition of the company; - carry out basic financial transactions; - calculate the profitability of entrepreneurial activity.
Examination forms	Test
Study and examination requirements	<p>Timely delivery of calculations of practical work, full performance of all types of work (practical and independent) are required.</p> <p>A mandatory requirement of the course is to prepare for each lesson. It is necessary to review the specified sections of the textbook and additional material not only when preparing for practical classes, but also before attending the corresponding lecture.</p> <p>Final exam: consists of four tasks of different difficulty levels, three simple for 25 points and one difficult for 15 points. Skipping an exam for a disrespectful reason deprives you of the right to take it. If you miss the exam for a good reason, a special permit is issued and the date, time and place of the exam are assigned.</p> <p>Prompting and cheating during exams, passing the exam for another student are unacceptable. A student caught falsifying any course information will receive a final grade of "F".</p> <p>Mandatory use of electronic gadgets in the classroom, which is welcome, but it is unacceptable to use them in the exam</p>
Reading list	<p>Basic literature:</p> <ol style="list-style-type: none"> [1] E.V. Lysakovskaya. General characteristics and models of state regulation of small and medium-sized enterprises in developed countries// Law and Education, No. 5, 2011, pp. 261 - 266 [2] Civil Code of the Republic of Kazakhstan dated July 1, 1999 No. 409th (Special Part) (with amendments and additions as of 06.03.2013) [3] Law of the Republic of Kazakhstan "On Private Entrepreneurship" (with amendments and additions as of 02.04.2010) [4] A. N. Asaul. Organization of entrepreneurial activity: textbook /. - St. Petersburg: ANO IPEV, 2009. 336s. [5] Koshanov A.K., Mukhamedzhanov B.G., Bektemisova S.T. Formation of private entrepreneurship in the conditions of transition to the market (on the example of the Republic of Kazakhstan). - Almaty: Institute of Economics, PAN RK, 2009. [6] Bocharov S.A., Ivanov A.A., Oleinikov S.Ya. FUNDAMENTALS OF BUSINESS: Study guide. -- M.: Publishing house of the center of the EAOI, 2007. - 447 p. [7] http://www.enbek.gov.kz/

Module designation	HUM129 Culturology
Semester(s) in which the module is taught	Fall and Spring Semesters (1 and 2) Course 1
Person responsible for the module	Anassova Kalamkas Temirkulovna
Language	Russian
Relation to curriculum	Required component Basic discipline
Teaching methods	Lecture, practical classes, SRO, SROP
Workload (incl. contact hours, self-study hours)	15 academic hours Lecture-15h
Credit points	2 credits: contact - 1 (lecture - 1 credit), contactless - 1 credit (SROP, SRO)
Required and recommended prerequisites for joining the module	The goal is to form ideas about culture as a social phenomenon, the development of a socio-humanitarian worldview as the basis for the modernization of social consciousness through the formation of cultural identity, the ability to analyze and assess cultural situations based on an understanding of the nature of cultural processes, the specifics of cultural objects, the role of cultural values in intercultural communication. Tasks: <ul style="list-style-type: none"> - give students the necessary minimum of theoretical knowledge about the essence, structure, functions, mechanism and historical types of culture; - develop the ability to understand and respect various national-cultural concepts, to productive communication of representatives of different cultures; - help to navigate the world of cultural symbols, directions in art; - promote a harmonious combination of special and humanitarian knowledge, the formation of cultural orientations and personality attitudes; - give an objective assessment of the national cultural heritage from the standpoint of maintaining the status of Kazakh culture, the Kazakh language and their role in the formation of cultural and national identity; - assess the state of modern Kazakh culture, identify and justify the prospects for its development and areas of modernization; to build programs of professional activities taking into account cultural characteristics;
Module objectives / intended learning outcomes	The course «Cultural Studies» will help students to develop an orientation towards humanitarian values, will help to master the spiritual wealth created by humanity. The development of not only an individual, but also the entire society is impossible without studying the cultural heritage created by previous generations, and this study itself, in turn, will be impossible without acquiring certain skills and cultural literacy. The course aims to humanize technical education.
Content	The classes use various technologies for the development of critical thinking: stage case, essay writing, (Mind Map), etc.
Examination forms	Examination cards
Study and examination requirements	<ul style="list-style-type: none"> - 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	<ol style="list-style-type: none"> 1. Нуржанов Б.Г., Ержанова А.М. Культурология. - Алматы, 2011. 2. Тимошинов В.И. Культурология: Казахстан-Евразия-Восток-Запад: Учебное пособие. – 400 с. Алматы, 2001 3. Бейсенова Г.А. Проблемы глобализации и идентичности – А.,Print, 2009.

Module designation	HUM122 Psychology
Semester(s) in which the module is taught	Autumn and spring semesters (1 and 2) for students of the 1st year of education
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: <ul style="list-style-type: none"> - 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 studies (analysis of specific situations), project method (development and transformation of own experience and competence)
Examination forms	Examination cards
Study and examination requirements	<ul style="list-style-type: none"> - 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	HUM127 Sociology
Semester(s) in which the module is taught	Fall and spring semesters 2.3 course.
Person responsible for the module	Yesbergenova Gulnur Bakitbekovna
Language	Russian, Kazakh
Relation to curriculum	Elective
Teaching methods	Lecture
Workload (incl. contact hours, self-study hours)	1 credit Lecture-15h.
Credit points	Lecture-1 credit
Required and recommended prerequisites for joining the module	To master this discipline, knowledge, skills and skills acquired in the following disciplines are required: <ul style="list-style-type: none"> - Modern history of Kazakhstan; - introduction to the specialty; - History of Kazakhstan, "People and society.
Module objectives / intended learning outcomes	The goal of the program is to form a socio-humanitarian worldview of students in the context of solving the problems of modernizing public consciousness, determined by the state program «Looking to the Future: Modernizing Public Consciousness». After completing the course. The student must be able to: <ul style="list-style-type: none"> - reasonably discuss problematic issues on the course, - develop and conduct research on social problems to master the skills: writing analytical reports specialized subject s: <ul style="list-style-type: none"> - draw up a program of sociological research; compile a toolkit for sociological research; - acquire skills: preparing a brief report as a result of sociological research, making practical recommendations. - correctly express and reasonably defend their own opinion on issues of social importance. At the end of the course, the student should know: - the ratio of natural and social in the formation and development of the individual and the determination of human behavior, society as a holistic system and its systemic properties. - the history of sociology; main sociological directions and schools; - methods of conducting sociological research; the basics of family sociology; - basic concepts, features of the family situation in the country and the world and trends of its changes; - various forms of cultural manifestation in the context of modernist tendencies, structure and distribution of cultural potential in society; main subcultural directions.
Content	The course consists of a problem-oriented course of lectures, involving discussive and polemical discussions of their subject content. This procedure for building a training course is based on the preliminary information readiness of students on the materials of the topics and problems of the specified course, the readiness of students for a reasoned discussion of the problems of the upcoming lecture. To do this, the teacher must provide students with problematic issues and a list of literature of upcoming lectures in advance. Students must read materials before each lecture
Examination forms	Test questions
Study and examination requirements	Availability of computer and computer equipment; <ul style="list-style-type: none"> - 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	<p>1. Biekenov K.U., Biekenova S.K., Kenzhakimova G.A. «Sociology: Academic Special». - Almaty: Evero, 2016. – 584 pages. «Sociology. Basics of the general theory: a textbook» /Ed. G.V.Osipov, L.N. Moskvichev. - 2nd ed., Rev. and additional. - M.: Norma, 2015. – 912 pages.</p> <p>3. Giddens E. «Sociology » /With the participation of C. Birdsall: translation from english. Ed.2nd, completely overwrought. and additional M.: Yeditorial URSS, 2005. - 632 p.</p> <p>4.Ritzer J. «Modern Sociological Theories». 5th ed. - St. Peter, 2002. - 688 p.5</p> <p>5. Garaja V.I. «Sociology of Religion»: Textbook. - 4th ed., Rev. and additional - M.: INFRA-M,2014. - 304p. - (Higher education. Baccalaureate).</p> <p>6. Z. Zhanazarova «Family and Society». - Almaty: Kazakh university, 2014. – 133 pages.</p> <p>7. Giddens A., Sutton Ph. Sociology. Wiley Academic, 2017. (Gidens A, Sutton F. Soushiolodzha.Wiley Akademik, 2017)</p>
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Module designation	HUM128 Political science
Semester(s) in which the module is taught	Fall and Spring Semesters (1 and 2) Course 1
Person responsible for the module	Manapova Saniyam Ilyaeвна
Language	Russian
Relation to curriculum	Basic discipline
Teaching methods	Lecture, practical classes, SRS
Workload (incl. contact hours, self-study hours)	30 academic hours Lecture-15h, CPS- 15 hours
Credit points	2 credits: contact - 2 (lecture - 1 credit, contactless - 1 credit (SRS))
Required and recommended prerequisites for joining the module	The goal is to form students' knowledge of the theory of politics, laws and patterns of political life and the ability to use political science knowledge in future professional activities Course Task: Study of laws, basic norms and peculiarities of interaction between states and other subjects of international relations in modern conditions. Particularly significant is the study of decision-making mechanisms, roles and functions of critical institutions in the system of international conflict resolution and consensus-building among States. Corresponding place in political research. Training outcomes: analyze the peculiarities of political systems and the functioning of political institutions; - to critically evaluate theoretical approaches of political science; - identify the interrelationships and patterns of the political process; - compare political systems, institutions and actors in the inter-country and subnational context, on the basis of knowledge gained and mastered methods.
Module objectives / intended learning outcomes	The course is intended for students of all undergraduate specialties, political science is a necessary theoretical basis for the further development of political research and for the introduction of scientific developments into real politics. It explores real political systems, ways of organizing society and the state, types of political regimes, forms of state structure, the activities of political parties and public organizations, the state of political consciousness and political culture, patterns of political behavior, problems of efficiency and legitimacy of political leadership, ways of forming institutions of power and more.
Content	The classes use the case method, the "Six Thinking Hats" method, the «Fishbone» method, and essay writing.
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	1. Kazakhstan Political Science Encyclopedia/Ed. T.T. Mustafina. - Almaty, 1998y. 2. Pushkareva, G.V. Political Science: textbook and workshop for universities/G.V. Pushkarev. - Moscow: Yurite Publishing House, 2021. – 295 pages. 3. G.M. Sergazina, R.N. Abylkalykova/Political Science: a textbook (2nd edition). - Karaganda: Medet Group LLP. — 2019. 270 pages.

Module designation	MAT101 Mathematics I
Semester(s) in which the module is taught	autumn semester (1 semester)
Person responsible for the module	Keltenova Raushan Turlybekova
Language	russian
Relation to curriculum	Compulsory
Teaching methods	Lecture, practical classes, SRO
Workload (incl. contact hours, self-study hours)	5 - 1/0/2/2 Lecture – 15 credits Practical classes – 30 credits
Credit points	Lecture – 15 credits Practical classes – 30 credits
Required and recommended prerequisites for joining the module	No
Module objectives / intended learning outcomes	<p>The key question is: what learning outcomes should students achieve within the module?</p> <p>As a result of mastering the discipline "Mathematics I", the student must:</p> <p>know:</p> <ul style="list-style-type: none"> -laws of operating with matrices and their application for solving systems of linear equations; -definitions of the basic concepts: limit, derivative, differentials of various orders and be able to apply them to the study of functions; -methods of finding extremums of functions, methods of studying their qualitative properties; -Taylor's formula and the basic forms of residual terms; -elements of analytical geometry: various equations of straight lines, equations of curves of the second order. <p>be able to:</p> <ul style="list-style-type: none"> - operate with matrices: perform arithmetic operations on them, search for inverse matrices; - to find derivatives, differentials, extremes of functions of one variable, areas of monotony and areas of convexity and concavity, inflection points, build asymptotes; to find complete, partial derivatives and differentials, extremes of functions of several variables; - apply Taylor's formula to approximate calculations; - write out various types of equations of straight lines, second-order curves, find the angle between straight lines on the plane.
Content	Module "Mathematics I" sections: Linear algebra and analytical geometry; Introduction to analysis; Differential calculus of a function of one variable; Differential calculus of a function of several variables.
Examination forms	Exam tickets, test questions
Study and examination requirements	<ul style="list-style-type: none"> - 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	<p>[1] Bugrov Ya.S., Nikolsky S.M. Higher Mathematics. M. Bustard. 2018 Vol.1-2.</p> <p>[2] Kudryavtsev V.A., Demidovich V.P. A short course of higher mathematics – M.: AST, Astrel, 2001- 656 p</p> <p>[3] Berman G. N.B. Collection of problems on the course of mathematical analysis - St. Petersburg: Publishing House "Lan", 2017. - 492 p</p> <p>[4] Ryabushko A.P. Collection of individual tasks in higher mathematics. Ch.1, 2, 3- Minsk.:Higher School, 2014</p> <p>[5] Lungu K.N., Written D.T. Collection of problems in higher mathematics. - M.: Iris-press, 2020.</p>

Module designation	MAT102 Mathematics II, III
Semester(s) in which the module is taught	spring semester (2nd semester)
Person responsible for the module	Keltenova Raushan Turlybekova
Language	russian
Relation to curriculum	Compulsory
Teaching methods	Lecture, practical classes, SRO
Workload (incl. contact hours, self-study hours)	5-1/0/2/2 Lecture – 15 credits Practical classes – 30 credits
Credit points	Lecture – 15 credits Practical classes – 30 credits
Required and recommended prerequisites for joining the module	Start the course after passing the discipline "Mathematics I".
Module objectives / intended learning outcomes	<p>The key question is: what learning outcomes should students achieve within the module?</p> <p>As a result of mastering the discipline "Mathematics II", the student must:</p> <p>know:</p> <ul style="list-style-type: none"> - concepts of indefinite and definite integral; - basic methods of integrating a function of a single variable; - the main applications of the integral; - multiple integrals; - numerical series with positive terms and alternating series; - functional and power series; - the main signs of convergence; - applications of power series. <p>be able to:</p> <ul style="list-style-type: none"> - apply theoretical knowledge in practical classes; - choose the right method for finding the primitive and calculating a certain integral; - calculate multiple integrals; - investigate numerical and functional series for convergence; - decompose functions into Maclaurin and Taylor series.
Content	Module "Mathematics II" sections: Indefinite integral; Definite integral; Multiple integrals; Numerical series. Power series. Fourier series.
Examination forms	Exam tickets, test questions
Study and examination requirements	<ul style="list-style-type: none"> - 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	<p>Piskunov N.S. Differential and integral calculus. Volume 1. - M. Nauka. 1985.</p> <p>Danko P.E., Popov A.G., Kozhevnikov T. Ya. Higher mathematics in exercises and problems. In 2 h. Ch. I, 2: M.: Higher School, 1999.</p> <p>Written D.T. Lecture notes on Higher Mathematics, Part 1, Part 2, - Moscow: Rolf, 2000. Titles of textbooks, articles, etc.</p> <p>Gusak A.A. Higher Mathematics, Vol. 2, Mn.: TetraSystems, 2003.</p> <p>Berman G.N. Collection of problems on the course of mathematical analysis. St. Petersburg, 2004.</p> <p>Lungu K.N., Norin V.P. Collection of problems in Higher mathematics, part 2, Moscow: Iris Press, 2004.</p> <p>Ryabushko A.P. Collection of individual tasks in higher mathematics. Ch. 1, 2, 3, Minsk.: Higher School, 2006</p> <p>Sobol B.V. Practicum on Higher Mathematics, Rostov n/A: Phoenix, 2006</p>

Module designation	GENI77 Engineering and computer graphics																												
Semester(s) in which this module is taught	autumn																												
The person responsible for the module																													
Language	Kazakh, Russian																												
Relation to the curriculum	Cycle of base disciplines (B)																												
Teaching methods	1 credit lectures / 2 credits of practical training																												
Workload (incl. contact hours, hours of independent work)	Module – 5 credits 1 credit KZ – 15 hours 1 ECTS – 30 hours 1 credit lectures - contact hours 15 hours 2 credits of practical training – 30 hours Total module - 150 hours Total module - 5 ECTS																												
Credits	5 credits																												
Necessary and recommended prerequisites of the module	No																												
Module objectives/expected learning outcomes	<ul style="list-style-type: none"> • study of the theoretical foundations for the execution and reading of design documents, methods for constructing spatial forms on a plane, methods for solving engineering and technical problems on a drawing, developing students' spatial thinking and instilling independent work skills; • teaching students to work with graphic information of various types and content, the basics of graphic representation of information, methods of graphic modeling of geometric objects, rules for the development and execution of design documentation, graphic models of phenomena and processes; • students mastering the methods and means of computer graphics, acquiring knowledge and skills in working with the AutoCAD computer-aided design system. 																												
Content	The study of methods for obtaining certain graphical models of space based on orthogonal projection and the ability to solve problems on these models related to spatial forms and relationships. Mastering the basic principles and methods of geometric modeling and methodology for developing graphic applications. Mastering the knowledge of building a drawing, the ability to read and draw up graphic and text design documentation in accordance with the requirements of regulatory documents, state standards. Acquaintance of students with the concept of computer graphics, geometric modeling, graphic objects, with modern interactive graphic systems for solving problems of automating drawing and graphic work using the example of AutoCAD. Formation of skills in the use of universal graphic systems for the development and editing of drawings using three-dimensional computer modeling, design automation in relation to the development and execution of design documentation.																												
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 border="1"> <thead> <tr> <th colspan="2">Maximum marks by the tasks types</th> </tr> </thead> <tbody> <tr> <td>student's independent work 1</td> <td>5</td> </tr> <tr> <td>student's independent work 2</td> <td>5</td> </tr> <tr> <td>student's independent work 3</td> <td>5</td> </tr> <tr> <td>student's independent work 4</td> <td>5</td> </tr> <tr> <td>1st intermediate certification (Midterm)</td> <td>10</td> </tr> <tr> <td>student's independent work 5</td> <td>5</td> </tr> <tr> <td>student's independent work 6</td> <td>5</td> </tr> <tr> <td>student's independent work 7</td> <td>5</td> </tr> <tr> <td>student's independent work 8</td> <td>5</td> </tr> <tr> <td>2nd final certification (Endterm)</td> <td>10</td> </tr> <tr> <td>Final exam</td> <td>40</td> </tr> <tr> <td>Total</td> <td>100</td> </tr> </tbody> </table>			Maximum marks by the tasks types		student's independent work 1	5	student's independent work 2	5	student's independent work 3	5	student's independent work 4	5	1st intermediate certification (Midterm)	10	student's independent work 5	5	student's independent work 6	5	student's independent work 7	5	student's independent work 8	5	2nd final certification (Endterm)	10	Final exam	40	Total	100
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List of literature	Base references	Additional references																											

[1] ЕСКД. Общие правила выполнения чертежей. – М.: Госстандарт, 1980.	[6] Справочник по машиностроительному черчению – М.
[2] Есмухан Ж.М. Краткий конспект лекций по начертательной геометрии. – Алматы: КазНТУ, 1994.	[7] Короев Ю.И. Начертательная геометрия. М.: 2004
[3] Чекмарев А.А. Инженерная графика. М; 2000.	[8] Есмуханов Ж.М., Куспеков К.А., Есмуханова Ж.Ж., Карпеков Р.К. Тесты по начертательной геометрии. Алматы, 1998.
[4] Фролов С.А. Начертательная геометрия. М. ИНФРА-М. 2013.	[9] Чуприн А.И. AutoCAD 2002. Трехмерное проектирование. – СПб.: 2002.
[5] Есмуханов Ж.М. Начертательная геометрия. Задачник – минимум. Часть 1	[10] Ордабекова А. Ж. Исследование и создание графических моделей в системе AutoCAD. Алматы 2016

Module designation	MIN502 Mining
Semester(s) in which this module is taught	Spring
Person responsible for the module	Kozhantov Arystan U
Language	Russian/Kazakh
Attitude towards the curriculum	The cycle of basic disciplines (B) is a compulsory discipline
Optional component (EC) - elective discipline	2 lecture credits / 1 practical training credit / 2 self-study credits
Workload (incl. contact hours, self-employment hours)	Module - 5 credits 1 KZ credit - 15 hours 1 ECTS - 30 hours 2 lecture credits - contact hours 30 hours 1 credit of practical training - 15 hours 2 credits of independent work - 105 hours (of which 30% is independent work of the student with the teacher - 30 hours; independent work of the student is 70% - 75 hours) Total module - 150 hours Total module - 5 ECTS
Credit scores	5 credits
Required and Recommended Prerequisites for Attaching to the Module	The course is intended for students of the Mining Engineering specialty and considers obtaining general information about mineral deposits, mining methods, and enrichment principles.
Module objectives / intended learning outcomes	Upon completion of the course, the student must demonstrate ability. create a project; design underground mine workings, ore bodies, slopes; analyze underground mine workings, ore bodies, block models. The student must be able to: As a result of studying the discipline in accordance with the state standard of higher education, students should know: - The history of the development of mining in the territory of the Republic of Kazakhstan, in the CIS countries and far abroad; - The level of extraction of minerals and their need in the national economy; - Information about mineral deposits and conditions of their occurrence; - Use and measures for the protection of subsoil; - Methods for the development of minerals and prospects for the development of methods; - Essence of open pit mining; main elements and parameters of a quarry; - Mining workings, open pit mining methods and main processes, their unit cost, main technical and economic indicators of quarry operation; - The essence of underground mining and the main mine workings; the main production processes and their unit cost, the main technical and economic indicators of the mines; - Features of technology for the development of building rocks; integrated use of raw materials; the main performance indicators of enterprises for the extraction of building rocks; - Basic concepts of mining by geotechnological methods; basic technological processes; technical and economic indicators; - The essence of the technology of underwater mining; - Essence of enrichment and processing of mineral raw materials; - Economic feasibility of using various methods of mining; - Environmental consequences of mining operations and their impact on the environment. At the end of the course the student should know: The assimilation of the discipline will allow students to be able to assess the mining and geological conditions of mining operations, to have an initial understanding of the methods of developing mineral deposits.
Content	In contrast to the underground method of mining, when all production processes for separating the mineral from the massif and transporting it to the surface are carried out using mine workings deep underground, the open method is associated with the implementation of production processes in the open. An open-pit mining enterprise is called a quarry. The advantages of open pit mining in certain mining conditions in comparison with underground are obvious. Level of knowledge of the module content: achievement of competencies - Level 6 of the National Qualifications Framework. Qualification (degree) of a bachelor. These phrases are for everyone.
Exam forms	Each control work, except for tests, is evaluated according to 4 criteria: - accuracy and accuracy - 30% (how accurately and accurately the work is calculated); - creativity and creativity - 30% (how and in what way the work is presented); - completeness and maturity - 40% (how deeply, logically and structurally the work is solved); - originality – a special coefficient 1.0; 0.5 or 0 is used. Exam in writing (ticket of 3 questions), there is a zero ticket in the form of a guide for

	passing the exam on the website https://sso.satbayev.university , login under the student's login.	
Tuition and Exam Requirements	Maximum assessment of knowledge by types of tasks	
	Activity in lecture discussions	14 lectures on 1 points = 14
	Completion of tasks (SRSP)	4 SIRS of 2 points = 8
	Performing practical exercises	4 works of 2.5 points = 10
	1st intermediate certification (Midterm)	RC-1: 10 points=10
	Independent work of the student (semester)	2 CPC по 4 балла=8
	2nd final certification (Endterm)	RC-2: 10 points=10
Final exam	40	
Total	100	
Bibliography	Basic Literature	Additional literature
	[1] Nekrasovsky Ya.Ya., Kolokolov O.V. Fundamentals of mining technology. M:Nedra, 1982.	[3] I. Arens V.Zh. Physicochemical Geotechnology. Textbook for High Schools.M.: MGGU, 2001.
	[2] Bryukhovetsky O.S., Bunin N.V., Kovalev I.A. Technology and complex mechanization of the development of mineral deposits. Textbook for High Schools. M: Nedra, 1989.	[4] Open pit mining. Directory. M: MiningBureau, 1994. [5] Kilechkov A.P. Mining technology. M:Nedra, 1979. [6] Rakishev B.R., Sofrygin V.P. Tasks for open-pit mining processes. Tutorial. Almaty, KazNTU, 1999. [7] Rogatin N.N. Introduction to the specialty. – M.: MGI, 1975.

Module designation	PHY111-112 Physics I, II
Semester(s) in which the module is taught	1st and 2nd semester
Person responsible for the module	Bedelbaeva Gulnar Esmukhametovna
Language	Kazakh, russian
Relation to curriculum	<i>Compulsory</i>
Teaching methods	Practical classes – contact, independent work of student and independent work of a 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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	No
Module objectives / intended learning outcomes	The main goal of teaching the course Physics I and Physics II is to form ideas about the modern physical picture of the world and the scientific worldview.
Content	The disciplines Physics I and Physics II are the basis for theoretical training and for engineering and technical activities of graduates of a higher technical school and represent the core of the physical knowledge necessary for an engineer operating in the world of physical laws. The course "Physics 1" includes sections: the physical foundations of mechanics, the structure of matter and thermodynamics, electrostatics and electrodynamics. The discipline "Physics II" is a logical continuation of the study of the discipline "Physics 1", and forms a holistic view of the course of general physics as one of the basic components of the general theoretical training of bachelors of engineering and technical profile. The discipline "Physics II" includes sections: magnetism, optics, nanostructures, fundamentals of quantum physics, atomic and nuclear physics.
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: <ul style="list-style-type: none"> - 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	Trofimova T.I. Physics course: Educational allowance for universities. M.: Academy, 2004.- 560 p Trofimova T.I., Pavlova Z.G. Collection problems in the course of physics with solutions: Educational allowance for universities. Edition 2nd, corrected / 3rd – 591 p. M: Higher School, 2002. Saveliev I.V. Course of general physics. T.1. Mechanics, oscillations and waves, molecular physics. –M.: Nauka, Editor-in-Chief of Physics and Mathematics, 2005.-508 p Saveliev I.V. Course of general physics. T.2. Electricity. -M.: Nauka, Chief editor of physical and mathematical sciences, 2005.-426 p Grabovsky R.I. Physics Course: Textbook for universities. Ed. 6th - 608 p. {Textbooks for universities: Special literature}, St. Petersburg: Lan, 2002. Detlaf A.A., Yavorsky B.M. Physics course: Textbook for universities. Ed. 6th, rev. - 607 p. M: Higher School, 2003.

Module designation	SNE451 Life safety
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	
Language	Kazakh, russian
Relation to curriculum	Required component
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	Total workload: Contact hours:3 hours a week and 1 office hour per group
Credit points	5 <i>ECTS</i>
Required and recommended prerequisites for joining the module	5 credits: contact – 3 (lecture – 1 credit, practice – 2 credits), contactless – 2 credits (SROP, SRO)
Module objectives / intended learning outcomes	<p>The purpose of the discipline "Life Safety" is to form students' ability to recognize and evaluate the negative factors of the human environment, to determine the consequences for a person of harmful and damaging factors, to implement reliable methods of protection against them, to choose the best solution and correct behavior, safety and preservation of life during emergency natural, man-made and social situations.</p> <p>The tasks of mastering the academic discipline: acquiring an understanding of the problems of sustainable development, ensuring life safety and reducing the risks associated with human activities; formation of a culture of professional safety, the ability to identify hazards and assess risks in the field of their professional activities</p>
Content	The discipline "Fundamentals of Life Safety" is included in the cycle of general education disciplines (mandatory component) and is aimed at teaching students, which makes it possible to obtain general knowledge on safety, protection and first aid for victims of natural and man-made emergencies, analyze the situation and make the right decision on rescue and assistance to people in the disaster zone.
Examination forms	Multivariate test
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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	<p>Life safety, Mikryukov, Vasily Yurievich, 2007</p> <p>Chuvin B.T. A person in an extreme situation - M.: Humanitarian. ed. center VLADOS, 2012 – 351 pages</p> <p>Zinovieva O.M., Mastryukov B.S., Ovchinnikova T.I., Pavlov A.A. Security vital activity. Forecasting and assessment of the consequences of man-made accidents and natural disasters: teaching aid - M.: MISiS, 2007 - 122 pages</p> <p>Life safety: Textbook. 14th ed., Sr. / Ed. HE. Rusaka.- St. Petersburg: Publishing house "Lan", 2012.- 672 pages</p>

Module designation	CHE495 Chemistry
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Iskakova Tynyshtyk Kadyrovna
Language	Kazakh, russian
Relation to curriculum	Compulsory
Teaching methods	lecture, practical classes, SRO, SRO P
Workload (incl. contact hours, self-study hours)	Total workload: Contact hours:3 hours a week and 1 office hour per group
Credit points	5 <i>ECTS</i>
Required and recommended prerequisites for joining the module	No
Module objectives / intended learning outcomes	The purpose of the course: Formation of knowledge on the fundamental issues of general chemistry and the skills of their application in professional activities. Course objective: <ul style="list-style-type: none"> - transfer basic theoretical knowledge in the course of chemistry; - help students gain laboratory skills; - teach how to solve typical problems and paint reaction equations; - which contributes to the informal assimilation of theoretical material; - to form students' chemical thinking skills.
Content	The course "General Chemistry" considers the laws, theoretical provisions and conclusions that underlie all chemical disciplines, studies the properties and relationships of chemical elements based on the periodic law of D.I. Mendeleev and on modern ideas about the structure of matter, the basics of chemical thermodynamics and kinetics, processes in solutions, the structure of complex compounds.
Examination forms	1. Midterm control: 2 times a semester 2. Independent student work (SIW): 4 3. Tests (Quiz): 8 4. Final exam
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: <ul style="list-style-type: none"> - 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	1. Chang Raymond, Goldsby Kenneth. Chemistry / 12th ed. - New York: Mc Graw Hill Educational, 2016. - 1136 p. - ISBN 978-1-259-25458-1. 2. Korovin N.V. General Chemistry: Proc. for universities / N.V. Korovin. - 10th ed. Add. - M.: Higher. school, 2008. - 557 p. : sick. - (Winner training competition). - ISBN 978-5-6-004403-4. 3. Zoya Tuiebakhova, Seyda Bucak, Deniz Rende, Nihat Baysal. Techniques and Experiments in General Chemistry. - Turkey : Caglayan Kitabevi, 2017. - 268 p. : ill. - ISBN 978-975-307-090-5. 4. Glinka N.L. General chemistry [Text]: textbook. allowance / N.L. Glinka. - ed. erased - M. : KnoRus, 2018. - 750 p. : ill. - ISBN 978-5-406- 06002-5. 5. Karapetyants M.Kh. General and inorganic chemistry: Proc. allowance for universities / M.Kh. Karapetyants, S.I. Drakin. - M.: Chemistry, 2002. - 592 p.: ill. - (For higher schools). - ISBN 5-7245-1130-4. 6. Adamson B.I., Goncharuk O.N., Kamyshova V.K. etc. Tasks and exercises in general chemistry: textbook. allowance for higher educational institutions / A.P. Adamson [and others]; ed. N. V. Korovina. - 4th ed., revised. - M. : Highest. school, 2008. - 255 p. : ill. - ISBN 978-5-06-004140-8.

Module designation	CSE677 Information and Communication Technology
Semester(s) in which the module is taught	4 semester
Person responsible for the module	Mukhamediev Ravil Ilgizovich Dzhunisov Auezkhan Toregeldievich
Language	English
Relation to curriculum	Required component
Teaching methods	lecture, practical exercises, IWS, independent work of a student with a teacher
Workload (incl. contact hours, self-study hours)	
Credit points	5 credits: contact - 3 (lecture - 1 credit, practice - 1 credits), non-contact - 2 credits (ISW, including ISW with a teacher)
Required and recommended prerequisites for joining the module	No
Module objectives / intended learning outcomes	The course contains a training program aimed at leveling the basic knowledge of students in the field of information and communication technologies. It contains a full range of topics, according to the SCES Standard Curriculum, with a predominance of developing practical skills in working with data, algorithmization and programming. The course is designed in such a way as to teach students not only the basic concepts of architecture and modern infrastructure of information and communication technologies, but also teach how to use these tools to solve applied problems. To teach how to optimize processes, apply adequate models and methods for solving practical problems using modern methods and tools of information technology, automate routine processes, be productive and efficient.
Content	In the classroom, various technologies for the development of critical thinking are used: case studies, essay writing (Mind Map) etc.
Examination forms	Exam tickets
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	1. June J. Parsons and Dan Oja, New Perspectives on Computer Concepts 16th Edition - Comprehensive, Thomson Course Technology, a division of Thomson Learning, Inc Cambridge, MA, COPYRIGHT © 2014. 2. Lorenzo Cantoni (University of Lugano, Switzerland) James A. Danowski (University of Illinois at Chicago, IL, USA) Communication and Technology, 576 pages. 3. Craig Van Slyke Information Communication Technologies: Concepts, Methodologies, Tools, and Applications (6 Volumes). ISBN13: 9781599049496, 2008, Pages: 4288 4. Brynjolfsson, E. and A. Saunders (2010). Wired for Innovation: How Information Technology Is Reshaping the Economy. Cambridge, MA: MIT Press 5. Kretschmer, T. (2012), "Information and Communication Technologies and Productivity Growth: A Survey of the Literature", OECD Digital Economy Papers, No. 195, OECD Publishing.

Module designation	SNE452 Ecology and sustainable development
Semester(s) in which the module is taught	4 semester
Person responsible for the module	Mendybaev Serik Kukaevich
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	2 credits: contact – 3 (lecture – 1 credit, practice – credits), contactless – 1 credits (SROP, SRO)
Required and recommended prerequisites for joining the module	No
Module objectives / intended learning outcomes	- The discipline studies global environmental problems and the relationship with general development problems; the consequences of population growth and consumption of natural resources; conditions for sustainable existence on Earth; the mission of ecologists in solving contemporary environmental problems; environmental consequences of natural resource depletion and environmental pollution.
Content	The student is obliged: The student is obliged to: - actively participate in the educational process, showing creativity, individuality and creativity; - attend all types of classroom activities (lectures, practical classes); - timely perform and submit work strictly according to the "Schedule for the implementation and delivery of tasks in the discipline"; - to document the missed classes for a good reason; - work off all missed classes at the time specified by the teacher; - do not be late for classes; - show respect for the teacher; - observe a culture of behavior
Examination forms	Exam tickets
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	1. Akimova, T.V. Ecology. Man-Economy-Biota-Environment: Textbook for university students / T.A. Akimova, V.V. Haskin; 2nd ed., revised. and additional - M.: UNITI, 2017.- 556 p. 2. Akimova, T.V. Ecology. Nature-Man-Technology.: A textbook for students of tech. direction and spec. Universities / T.A. Akimova, A.P. Kuzmin, V.V. Khaskin. - Under the general. ed. A.P. Kuzmina; Laureate of the All-Russian competition to create new textbooks on general natural sciences. discipline for stud. universities. M.: UNITY-DANA, 2016.- 343 p. 3. Arkhangelsky, V.I. Hygiene and human ecology: Textbook / V.I. Arkhangelsky, V.F. Kirillov. - M.: GEOTAR-Media, 2017. - 176 p. 4. Brodsky, A.K. General ecology: A textbook for university students / A.K. Brodsky.- M.: Ed. Center "Academy", 2016. - 256 p. 5. Voronkov, N.A. Ecology: general, social, applied. Textbook for university students / N.A. Voronkov.- M.: Agar, 2016. - 424 p. 6. Galperin, M.V. General Ecology: Textbook / M.V. Galperin. - M.: Forum, 2016. - 336 p. 7. Mavrichhev, V.V. General ecology. Course of lectures: Textbook / V.V. Mavrichhev. - M.: NITs INFRA-M, Nov. knowledge, 2017. - 299 p. 8. Brukhan, F.F. Industrial Ecology: Textbook / F.F. Bryukhan, M.V. Grafkina, E.E. Sdobnyakova. - M.: Forum, 2017. - 208 p. 9. Zaitsev, V.A. Industrial Ecology: Textbook / V.A. Zaitsev. - M.: BINOM. LZ, 2016. - 382 p. 10. Kakareka, E.V. Industrial Ecology: Textbook / M.G. Yasoveev, E.V. Kakareka; Ed. M.G. Yasoveev. - M.: NITs INFRA-M, Nov. knowledge, 2017. - 292 p. 11. Korobkin V.I. Ecology: Textbook for university students / V.I. Korobkin, L.V. Peredelsky. -6th ed., add. And revised. - Roston n / D: Phoenix, 2007. - 575s.

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| | <p>12. Ksenofontov, B.S. Industrial ecology: Uch. settlement / B.S. Ksenofontov, G.P. Pavlikhin, E.N. Simakov. - M.: ID FORUM, NITs INFRA-M, 2016. - 208 p.</p> <p>13. Krymskaya, I.G. Hygiene and human ecology: Textbook / I.G. Crimean. - Rn / D: Phoenix, 2017. - 351 p.</p> <p>14. Larionov, N.M. Industrial ecology: Textbook for bachelors / N.M. Larionov, A.S. Ryabyshenkov. - M.: Yurayt, 2017. - 495 s</p> |
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Module designation	MAP113 Geodesy with the basics of topography
Semester(s) in which the module is taught	Spring Semesters
Person responsible for the module	Akhmetov Rustem Armanovich Zhanakulova Katima Amantayena
Language	Russian, kazakh
Relation to curriculum	Required component Basic discipline
Teaching methods	Lecture, practical classes, SRO, SROP
Workload (incl. contact hours, self-study hours)	15 academic hours Lecture-15h
Credit points	5 credits: contact - 1 (lecture - 1 credit, practice-2 credit),, contactless - 2 credit (SROP, SRO)
Required and recommended prerequisites for joining the module	As a result of mastering the discipline, students must one.know: - about the shape and dimensions of the Earth and its individual parts of the surface, about how to depict them on a map, about the close connection of geodesy with all the technological processes of a mining enterprise; - the device of the main geodetic instruments, the methodology for performing angular, linear and height measurements on the earth's surface, the rules for office processing of geodetic measurements, the basic requirements for compiling topographic documentation.
Module objectives / intended learning outcomes	The purpose of the course: to acquaint students with the science that studies the shape and size of the Earth's surface or its individual parts through measurements, in the mathematical processing of measurements with the construction of maps, plans used to solve engineering and other problems. The objective of the course: is to teach future specialists in the geological industry the basics of theoretical and practical knowledge in solving problems on topographic maps and plans; a complex of geodetic studies related to the implementation of topographic surveys for the preparation of large-scale plans; angular and linear measurements by optical-mechanical and electronic geodetic devices; in the mathematical processing of field measurements based on direct and inverse geodetic problems in accordance with the requirements of the instructions; determination of coordinates and elevations of points on the earth's surface in a single coordinate system; in the construction of the processed data on a plan or in a profile.
Content	The classes use various technologies for the development of critical thinking: stage case, essay writing, (Mind Map), etc.
Examination forms	Examination cards
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	1. Nurpeyisova M.B. Geodesy. - and others. Geodesy. - Astana: Foliant, 2016. - 240 pages 2. Poklad G.G., Gridnev S.P. Geodesy. - M.: Academic project, 2006. -592 page 3. Poklad G.G., Gridnev S.P. etc. Practicum on geodesy, textbook. - M.: Academic project, 2012. -470 page 4. Khodorov S.N. Geodesy is very simple. Introduction to the specialty.M-InfraEngineering. 2013-176page

Module designation	GEO 431 <i>General and historical geology</i>
Semester(s) in which this module is taught	<i>autumn</i>
The person responsible for the module	<i>Baibatsha Adilkhan Asubayeva Saltanat Amantaev Serzhan</i>
Language	<i>Kazakh/ Russian</i>
Relation to the curriculum	<i>Cycle of base disciplines (B) – compulsory discipline</i>
Teaching methods	2 credits lectures / 1 credit of laboratory classes / 2 credits credits of independent work
Workload (incl. contact hours, hours of independent work)	Module – 3 credits 1 credit KZ – 15 hours 1 ECTS – 30 hours 2 credits lectures - contact hours 30 hours 1 credit of laboratory classes – 15 hours 2 credits of independent work – 105 hours (of which 30% is independent work of the student with the teacher – 30 hours; independent work of the student is 70% - 75 hours) Total module - 150 hours Total module - 5 ECTS
Credits	<i>5 credits</i>
Necessary and recommended prerequisites of the module	The competencies of the module – GEO 431 General and historical geology
Module objectives/expected learning outcomes	The purpose of the course: developing a geological worldview among students; creating the basis for further obtaining special knowledge, skills in the process of studying all subsequent geological disciplines. Course objective: obtaining general ideas about the structure of the Universe, the internal structure of the Earth, the geological activity of the main factors of its external and internal dynamics, the form of occurrence of geological bodies, tectonic movements and methods of their study, the basic structures of the earth's crust. Personal and key skills: As a result of mastering the discipline, students will have managerial skills in conducting design research, organizational, underground and open-pit mining operations.
Content	The course examines the geological structure of the earth's crust; material (chemical, mineral, and petrographic) composition of the earth's crust; the main structural elements of the earth's crust with characteristic rock complexes; the main results of the most important endogenous and exogenous geological processes and their role in the formation of the earth's crust; forms of occurrence of geological bodies in the earth's crust, types of tectonic disturbances; methods for their representation on geological maps and sections, the concept of a geochronological (stratigraphic) scale.

Examination forms	<p>Each work, except for tests, is evaluated according to 4 criteria:</p> <ul style="list-style-type: none"> - 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 <p>The null version of the exam (a ticket of 3 questions) is provided before the exams.</p>																			
Requirements for training and exams	<p>Maximum marks by the tasks types</p> <table border="1" data-bbox="651 423 1489 658"> <tr> <td>Completion of tasks (IWUI)</td> <td>4 IWUI 2 points = 8</td> </tr> <tr> <td>Laboratory work</td> <td>8 works 4 points = 32</td> </tr> <tr> <td>1st intermediate certification (Midterm)</td> <td>M-1: 8 points=8</td> </tr> <tr> <td>Independent student work (IWS)</td> <td>2 IWS 6 points=12</td> </tr> <tr> <td>2nd final certification (Endterm)</td> <td>M-2: 8 points=8</td> </tr> <tr> <td>Final exam</td> <td>40</td> </tr> <tr> <td>Total</td> <td>100</td> </tr> </table>		Completion of tasks (IWUI)	4 IWUI 2 points = 8	Laboratory work	8 works 4 points = 32	1st intermediate certification (Midterm)	M-1: 8 points=8	Independent student work (IWS)	2 IWS 6 points=12	2nd final certification (Endterm)	M-2: 8 points=8	Final exam	40	Total	100				
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Module designation	GEO432 structural geology															
Semester(s) in which the module is taught	Spring															
Person responsible for the module	Arshamov Yalkunzhan Asubayeva Saltanat															
Language	Kazakh/ Russian															
Attitude towards the curriculum	The cycle of basic disciplines (B) is a compulsory discipline															
Teaching methods	2 credits lectures / 1 credit of laboratory classes / 2 credits credits of independent work															
Workload (incl. contact hours, self-employment hours)	Module - 5 credits 1 KZ credit - 15 hours 1 ECTS - 30 hours 2lecture credit - contact hours 15 hours1 credit of practical training - 15 hours 1 lab credit - 15 hours 1 credits of independent work - 105 hours (of which 30% is independent work of the student with the teacher - 30 hours; independent work of the student is 70% - 75 hours) Total module - 150 hours Total module - 5 ECTS															
Credit scores	5 <i>credits</i>															
Required and Recommended Prerequisites for Attaching to the Module	Prerequisite – GEO431 General and Historical Geology															
Module objectives/intended learning outcomes	The purpose of the course: structural geology studies various forms of occurrence of rocks, their location and relationships, formation conditions in the earth's crust. The completion of the discipline is a term paper. It aims to reinforce skills in reading geological maps. Based on an in-depth analysis of the geological tablet, an explanatory note is compiled, illustrated with graphical applications (maps, sections). Finished term papers after verification by their supervisor are protected by contractors and are accepted with a differentiated assessment. Course Objective: - study of the form of occurrence of rocks in the earth's crust; - methods for compiling and reading geological, tectonic and structural maps, - construction of geological sections and block diagrams, stratigraphic columns															
Content	The course "Structural Geology" studies the forms of geological bodies, undisturbed horizontally lying layers, deformations of rock formations, the formation of layers under the influence of endogenous, exogenous and cosmic factors; basic elements of folds, typification of folds, folded forms of high ranks (antecline, syncline, etc.); basic elements of discontinuous dislocations, their typification; kinematic types of faults (faults, faults, faults, etc.); features of the manifestation of deformations on platforms, in folded belts, rifts and other global tectonic structures															
Exam forms	Each control work, except for tests, is evaluated according to 4 criteria: - accuracy and accuracy - 30% (how accurately and accurately the work is calculated); - creativity and creativity - 30% (how and in what way the work is presented); - completeness and maturity - 40% (how deeply, logically and structurally the work is solved); - originality – a special coefficient 1.0; 0.5 or 0 is used. Exam in writing (ticket of 3 questions), there is a zero ticket in the form of a guide for passing the exam on the website https://sso.satbayev.university , login under the student's login.															
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Module designation	GEO433 Crystallography and mineralogy															
Semester(s) in which this module is taught	Autumn															
The person responsible for the module	Baisalova Akmaral Omarkhanovna Bekbotaeva Alma Anarbekovna															
Language	Russian/Kazakh															
Relation to the curriculum	Cycle of base disciplines (B) – compulsory discipline															
Teaching methods	2 credits lectures / 1 credit of laboratory classes / 2 credits credits of independent work															
Workload (incl. contact hours, hours of independent work)	Module – 5 credits 1 credit KZ – 15 hours 1 ECTS – 30 hours 1 credit lectures - contact hours 30 hours 4 credits of laboratory classes – 120 hours Total module - 150 hours Total module - 5 ECTS															
Credits	5 <i>credits</i>															
Necessary and recommended prerequisites of the module	Prerequisite – GEO431 General and historical geology.															
Module objectives/expected learning outcomes	<p>Students gaining knowledge on the main theoretical and applied issues of crystallography and mineralogy, which is the fundamental geological discipline that underlies the study of rocks, ore and non-metallic minerals, processes that occur in the earth's crust, as well as in space bodies</p> <p>Course Objective:</p> <ul style="list-style-type: none"> - mastering the fundamentals of crystallography, which is closely connected with industry, the development of which requires specialists to have in-depth knowledge in the field of crystallography; - the acquisition of skills in determining the elements of symmetry in crystalline polyhedra, in recognizing simple forms that are found in nature; - knowledge of the methods of visual diagnosis of common minerals; - gaining knowledge on the diagnosis of minerals by morphological features; - the ability to use paragenetic associations of minerals for the diagnosis of minerals; - gaining knowledge on the conditions for the formation of major minerals. 															
Content	<p>The course "Crystallography and Mineralogy" studies the basic concepts and laws of crystallography; classification of crystals based on their symmetry; geometric crystallography, which studies the external and internal structure of crystals; crystal chemistry or structural chemistry; crystallophysics. He understands the influence of the structure on the external form and physical properties of crystals, the main motives for constructing structures are wire-frame, sheet, ribbon, chain, with isolated groups of atoms; conditions of origin and location of minerals in nature; the main groups of minerals, their composition, physical properties and practical application, mineral formation processes and the corresponding mineral paragenesis; basic laws of the crystal structure, external forms, chemical composition, physical properties and conditions for the formation of crystals in the relationship.</p>															
Examination forms	<p>Each work, except for tests, is evaluated according to 4 criteria:</p> <ul style="list-style-type: none"> - 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 <p>The null version of the exam (a ticket of 3 questions) is provided before the exams.</p>															
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Total	100															

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	[8] Charles Fletcher. Physical geology: the science of Earth / University of Hawaii. Third Edition. Hoboken, NJ: John Wiley & Sons, Inc., 2017 – 706 p.	

Module designation	GEO434 Petrography	
Semester(s) in which this module is taught	<i>Spring</i>	
The person responsible for the module	Bekbotaeva Alma Anarbekovna	
Language	<i>Russian/Kazakh</i>	
Relation to the curriculum	<i>Cycle of base disciplines (B) – compulsory discipline</i>	
Teaching methods	1 credit lectures / 2 credits Laboratory / 2 credits credits of independent work	
Workload (incl. contact hours, hours of independent work)	Module – 5 credits 1 credit KZ – 15 hours 1 ECTS – 30 hours 1 credit lectures - contact hours 30 hours 4 credits of laboratory classes – 120 hours Total module - 150 hours Total module - 5 ECTS	
Credits	5 <i>credits</i>	
Necessary and recommended prerequisites of the module	PRE-REQUISITE – GEO433 Crystallography and mineralogy	
Module objectives/expected learning outcomes	The purpose of the course: comprehensive knowledge of the composition, structure, structure and texture, classification of igneous, sedimentary, metamorphic, metasomatic rocks, nomenclature and conditions of formation of rocks and their connection with mineral deposits. Course objective: - Study of igneous rocks: formation, material composition and structure. Structures and textures of igneous rocks. - Study of sedimentary rocks: formation, material composition, structure. Textures and structures of sedimentary rocks. Classification of sedimentary rocks. - Study of metamorphic rocks: factors and types of metamorphism, material composition, structure. Textures and structures of metamorphic rocks. Types of metamorphism: cataclastic, contact-thermal, regional, metasomatosis.	
Content	The course "Petrography" studies the composition, structure, conditions of occurrence, classification and regularities of formation of igneous, sedimentary, metamorphic and metasomatic rocks that meet the current level of science and the requirements of geological practice. Understands the connection of petrography with other geological disciplines and its significance for geological survey, prospecting and exploration of mineral deposits; applies methods of rock research; the main problems and tasks of petrography.	
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	8 works 4 points = 32
	1st intermediate certification (Midterm)	M-1: 8 points=8
	Independent student work (IWS)	2 IWS 6 points=12
	2nd final certification (Endterm)	M-2: 8 points=8
	Final exam	40
Total	100	

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	[6] Baibatsha A.B. Historical geology. Almaty: Complex, 2004, - 272 p.	[11] Wegener A. Origin of continents and oceans / per. with him. P. Г. Kaminsky under the ed. P. H. Kropotkina. - L .: Nauka, 1984. - 285 p.
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Module designation	GEO435 Geology and Mineral Resources of Kazakhstan															
Semester(s) in which this module is taught	<i>Spring</i>															
The person responsible for the module	Arshamov Yalkunzhan Bekbotaeva Alma Anarbekovna															
Language	<i>Russian/Kazakh</i>															
Attitude to the curriculum	<i>Cycle of basic disciplines (B)</i>															
Teaching methods	2 credit of lectures / 1 credits Laboratory / 2 credits of independent work															
Workload (incl. contact hours, self-employment hours)	Module – 5 credits 1 credit KZ – 15 hours 1 ECTS – 30 hours 2 credits of the lecture - contact hours 30 hours 1 credits Laboratory – 15 ours 2 credits of independent work – 105 hours (of which 30% is independent work of the student with the teacher – 30 hours; independent work of the student is 70% - 75 hours) Total module - 150 hours Total module - 5 ECTS															
Credit scores	5 credits															
Necessary and recommended prerequisites for joining the module	PRE-REQUISITE – GEO432 Structural geology															
Module objectives/expected learning outcomes	The purpose of the course: to Form a holistic view of the geological structure and development of the earth's crust within the territory of Kazakhstan, to get acquainted with the main types of mineral resources, their availability in the country in the future and priorities in the mineral resource complex. Course objective: - study of the geological structure of the subsoil of Kazakhstan; - familiarity with the basic principles of tectonic zoning of the territory of Kazakhstan; - familiarity with the main tectonic structures of the earth's crust, their stratigraphy and magmatic complexes, features and patterns of geological development and placement of mineral deposits in them. The main task of studying the discipline is to develop students of geologists ' geological thinking based on an extensive database of factual material with the ability to correctly structure it and use it in accordance with the logic of the fundamental conceptual geological paradigms. study of the form of rock occurrence in the earth's crust;															
Content	The article gives an idea of the geological structure of the subsoil and the development of the earth's crust within the territory of Kazakhstan, about the mineral resources of Kazakhstan, their classification, reserves, priority and strategic types of raw materials. Tasks of the geological survey of Kazakhstan at the present stage. The course contains information about the main types of mineral resources, the country's future supply of them, and priorities in the mineral resource complex.															
Examination forms	Each control work except tests is evaluated according to 4 criteria: – accuracy and accuracy – 30% (how accurately and accurately the work is calculated); – creativity and creativity – 30% (how and how the work is presented); – completeness and maturity – 40% (how deeply, logically and structurally the work is solved); – originality – a special coefficient of 1.0, 0.5 or 0 is used. The exam is in writing (a ticket of 3 questions), there is a zero ticket in the form of a guide for passing the exam on the website https://sso.satbayev.university , login under the student's username.															
Requirements for training and exams	Maximum marks by the tasks types <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Completion of tasks (IWUI)</td> <td style="text-align: right;">4 IWUI 2 points = 8</td> </tr> <tr> <td>Laboratory work</td> <td style="text-align: right;">8 works 4 points = 32</td> </tr> <tr> <td>1st intermediate certification (Midterm)</td> <td style="text-align: right;">M-1: 8 points=8</td> </tr> <tr> <td>Independent student work (IWS)</td> <td style="text-align: right;">2 IWS 6 points=12</td> </tr> <tr> <td>2nd final certification (Endterm)</td> <td style="text-align: right;">M-2: 8 points=8</td> </tr> <tr> <td>Final exam</td> <td style="text-align: right;">40</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">100</td> </tr> </table>		Completion of tasks (IWUI)	4 IWUI 2 points = 8	Laboratory work	8 works 4 points = 32	1st intermediate certification (Midterm)	M-1: 8 points=8	Independent student work (IWS)	2 IWS 6 points=12	2nd final certification (Endterm)	M-2: 8 points=8	Final exam	40	Total	100
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Module name and code	Module.GE0439 Sedimentology
Responsible for the module	PhD Ensepbaev T.A.
Module type	Basic, required module
Module level	BA
Number of hours per week	3
Amount of credits	5 (5 ECTS)
Form of study	full-time
Semester	5
Number of students	120
Module Prerequisites	General And Historical Geology
Module content	EMCD GE0439 Sedimentology Lecture (30): The course "Sedimentology" gives an idea of the subject of science, goals, objectives, place among other geological sciences. The discipline presents information about precipitation, its elemental, chemical, mineral and component composition. The issues of sediment mobilization, transportation, differentiation and accumulation are considered. The textural and structural features, facial conditions and conditions for the formation of sedimentary rocks are studied.
Learning Outcomes	As a result of mastering the discipline, students should 1) know: - History, problems, prospects and directions of development of science; - signs of precipitation and sedimentary rocks, as products of the Earth's exosphere; - Methodology for the study of precipitation and modern methods for their study; - instruments and technologies of field and laboratory, including crystal-optical diagnostics of precipitation components; - material composition of precipitation, texture and structural features; - the basic properties of sedimentary formations, including their reservoir properties; - features of the formation of sediments and sedimentary rocks; - the influence of ancient and modern landscape and climatic conditions on the formation of sedimentary rocks; - methods of paleogeographic research; - basics of facial analysis; - the basic physical and mechanical properties of sediments and sedimentary rocks; 2) be able to: - identify and describe the material and structural-texture features of sediments and sedimentary rocks; - classify and diagnose sedimentary rocks of various genesis; - use the crystal-optical method for the study of sedimentary rocks, as one of the leading methods; 3) own skills: - the use of the granulometric method for the study of sedimentary rocks for the nomenclature and genetic interpretation of the conditions of their formation; - analysis of landscape facies of sediment formation in the general genesis of rocks, using their structural and texture features and material composition
Form of final control	Written exam - 120 min.
Conditions for obtaining loans	- Attending a lecture;
Module duration	- Fulfillment of assignments for laboratory (practical) work and on the topics of SIWT.
Literature	- Exam
Update date	1 semester
Module name and code	Module.PET406 Drilling of the wells
Responsible for the module	Kgmn Kasenov A.K.
Module type	Basic, required module
Module level	BA
Number of hours per week	3
Amount of credits	5 (5 ECTS)
Form of study	full-time
Semester	5
Number of students	120
Module Prerequisites	General geology
Module content	EMCD PET406 Drilling of the wells

	Lecture (30): The discipline "Drilling of wells" plays an important role in the formation of specialists who will be engaged in prospecting and exploration of mineral deposits for oil, gas, fresh and mineral waters, as well as solid minerals. Knowledge of this discipline allows you to correctly determine the physico-mechanical properties of rocks, choose the most rational rock-destroying tools (bits, drill bits) and technical means for coring from wells, analyze phenomena occurring during the formation of a well, predict the performance of bits and drill bits.
Learning Outcomes	Student:1) know: - basic terms and definitions, well design, well classifications; - history, problems and prospects of development of well drilling technology; - technological processes of the production process of well construction; - methodology for designing the well structure, calculating casing strings and plugging the main technological processes. 2) be able to: - apply methods for modeling technological processes of drilling wells; - calculation of the well construction; - to develop the technology of drilling wells; 3) possess skills: - methods for constructing simple mathematical models of typical professional problems; - mathematical methods for solving natural science problems; - prepare and execute scientific, technical and service documentation.
Form of final control	Written exam - 120 min.
Conditions for obtaining loans	- Attending a lecture;
Module duration	- Fulfillment of assignments for laboratory (practical) work and on the topics of SIWT.
Literature	- Exam
Update date	1 semester
Module name and code	Module.GE0411 Geophysical methods of search and exploration
Responsible for the module	Dr. Istekova S.A.
Module type	Basic, required module
Module level	BA
Number of hours per week	3
Amount of credits	5 (5 ECTS)
Form of study	full-time
Semester	5
Number of students	120
Module Prerequisites	General geology
Module content	EMCD GE0411 Geophysical methods of search and exploration Physical and geological foundations, methods and techniques of work, processing and interpretation of the results of field, geophysical methods (electrical, magnetic, gravity, seismic, radiometry and nuclear geophysics) are described. The physical properties of rocks, and the nature of the associated physical fields are considered. The principles of operation and the device of geophysical equipment, techniques for performing field measurements and processing the data obtained are described, the scope of application is indicated. Field geophysical measuring instruments require students to have knowledge of electrical engineering, electronic measurement systems. According to the volume of collected field geophysical data, their processing and interpretation requires the use of computer technology.
Learning Outcomes	Student:As a result of mastering the discipline, students should 1) know: - modern ideas about the geological nature of geophysical anomalies; - methods of field geophysical work used in the search for mineral deposits; - main methods of processing and interpretation of the obtained geophysical materials; fundamentals of forecasting oil and gas potential from geophysical data; 2) be able to: - formulate tasks and justify the formulation of various types of field geophysical research; - process, analyze and systematize field geophysical information using modern methods of its automated collection, storage and processing; - use geophysical data to make a forecast for the area under study; - 3) possess skills: - methods of quantitative and qualitative analysis of geophysical fields; - skills for critical evaluation of scientific and technical information.

Form of final control	Written exam - 120 min.									
Conditions for obtaining loans	- Attending a lecture;									
Module duration	- Fulfillment of assignments for laboratory (practical) work and on the topics of SIWT.									
Literature	- Exam									
Update date	1 semester									
Module name and code	Module.GE0438 Geology of mineral deposits									
Responsible for the module	Doctor Baibatsha A.B.									
Module type	Profile, mandatory module									
Module level	BA									
Number of hours per week	3									
Amount of credits	5 (5 ECTS)									
Form of study	full-time									
Semester	5									
Number of students	120									
Module Prerequisites	General geology									
Module content	EMCD GE0438 Geology of mineral deposits Study of the geology of mineral deposits; conditions for the formation of endogenous, exogenous and metamorphogenic deposits; geological and physico-chemical processes of ore formation; geological structure of deposits, conditions of occurrence and morphology of ore bodies; mineral composition of ores, textures and structures of ores of endogenous, exogenous and metamorphogenic deposits; industrial-genetic types of mineral deposits and patterns of their location for geological forecasting and determining a rational set of methods for prospecting and exploration of deposits.									
Learning Outcomes	Student: 1) know: geological, physical and chemical conditions for the formation of various genetic types of mineral deposits, their relationship to certain structural and material complexes of rocks, the mineral composition of ores and classic examples of deposits. 2) be able to: distinguish genetic groups and classes of mineral deposits based on available geological and other indirect features. 3) possess skills: use available samples of ores and host rocks to determine the genetic type of mineral deposits.									
Form of final control	Written exam - 120 min.									
Conditions for obtaining loans	- Attending a lecture;									
Module duration	- Fulfillment of assignments for laboratory (practical) work and on the topics of SIWT.									
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Update date	1 semester									
Module name and code	Module.GE0429 Basic search and exploration of mineral deposits									
Responsible for the module	PhD Arshamov Ya.K.									
Module type	Basic, required module									
Module level	BA									
Number of hours per week	3									
Amount of credits	5 (5 ECTS)									

Form of study	full-time								
Semester	5								
Number of students	120								
Module Prerequisites	Structural geology								
Module content	EMCD GE0429 Basic search and exploration of mineral deposits Learning goals: Sustaining human society is a complex interdisciplinary challenge. New sources of metals are required to meet society's current and future needs and yet exploration for new mineral resources is increasingly difficult as fewer and fewer mineral deposits remain to be found exposed at the Earth's surface. Future mineral exploration will require a greater scientific understanding of the spatio-temporal distribution of mineral deposits and how they may best be found at depth in the subsurface.								
Learning Outcomes	Student:1) to know: geological bases of prospecting and exploration of mineral deposits; the specifics of the exploration of different types of mineral deposits; design methods and production technologies of geological exploration works; specifics of intelligence documentation; to know types and methods of testing of mineral raw materials; basic methods of calculating the reserves of useful fossil fuels; methods of organization, management of the enterprise; the state of the mineral base of the country and the prospects for its development. 2) be able to: correctly select and justify the methodology of geological exploration work in connection with geological, mining and geographical and economic features of the object of research; to conduct geological and economic evaluation of sites at different stages of geological exploration work; read graphs, diagrams, maps, diagrams, profile cuts, horizontal plans, characterizing geological structures of sites; to conduct the calculation of reserves (resources) and technical and economic analysis of geological exploration and prospecting processes. 3) master the skills: justification of methods of conducting geological exploration work; on the basis of the density of the intelligence network, the selection of rational methods of testing, the preparation of outgoing data for the calculation of stocks and the calculation of stocks by basic methods.								
Form of final control	Written exam - 120 min.								
Conditions for obtaining loans	- Attending a lecture;								
Module duration	- Fulfillment of assignments for laboratory (practical) work and on the topics of SIWT.								
Literature	<table border="1"> <thead> <tr> <th>Базовая литература</th> <th>Дополнительная литература</th> </tr> </thead> <tbody> <tr> <td>[1] Авдонин В.В. Поиски и разведка месторождений полезных ископаемых. М.: Академический проект, Фонд Мир, 2007</td> <td>[4] Аристов В.В. и др. Поиски и разведки месторождений полезных ископаемых. Лабораторный практикум. – М.: Недра, 1989.</td> </tr> <tr> <td>[2] . Каждан А.Б. Поиски и разведка место-рождений полезных ископаемых. производст-во геологоразведочных работ. – М.: Недра,</td> <td>[5] Волков В.Н. Геологическая документация и о поисково-разведочных выработок. С.Петербург, 2007</td> </tr> <tr> <td>[3] Погребницкий Е.О., Парадеев С.В., Поротов Г.С. и др. Поиски и разведки месторождений полезных ископаемых. – М.: Недра, 1977.</td> <td>[6] Инструкция о проведении геологоразведочных работ (твердые полезные ископаемые). – Кокшетау, 2006.</td> </tr> </tbody> </table>	Базовая литература	Дополнительная литература	[1] Авдонин В.В. Поиски и разведка месторождений полезных ископаемых. М.: Академический проект, Фонд Мир, 2007	[4] Аристов В.В. и др. Поиски и разведки месторождений полезных ископаемых. Лабораторный практикум. – М.: Недра, 1989.	[2] . Каждан А.Б. Поиски и разведка место-рождений полезных ископаемых. производст-во геологоразведочных работ. – М.: Недра,	[5] Волков В.Н. Геологическая документация и о поисково-разведочных выработок. С.Петербург, 2007	[3] Погребницкий Е.О., Парадеев С.В., Поротов Г.С. и др. Поиски и разведки месторождений полезных ископаемых. – М.: Недра, 1977.	[6] Инструкция о проведении геологоразведочных работ (твердые полезные ископаемые). – Кокшетау, 2006.
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Update date	1 semester								
Module name and code	Module.. GEO428 Mathematical Methods in Geology								
Responsible for the module	PhD Ensepaev T.A.								
Module type	Basic, required module								
Module level	BA								
Number of hours per week	3								
Amount of credits	5 (5 ECTS)								
Form of study	full-time								
Semester	5								
Number of students	120								
Module Prerequisites	Mathematics, ICT								
Module content	EMCD GEO428 Mathematical Methods in Geology The introduction of mathematics into the practice of geological work is subordinated to four main interrelated areas: 1) processing of numerical results of observations (methods of probability theory and mathematical statistics, mathematical analysis, game theory, geometric methods, etc.); 2) the study of qualitative characteristics (mathematical logic, applied cybernetics); 3) reconstruction of geological processes and forecast (modeling								

	using various mathematical tools); 4) optimization of the processes of collecting, storing, searching and processing geological information (information theory and technical documentary).		
Learning Outcomes	<p>Student:have an idea:</p> <ul style="list-style-type: none"> - on the principles and methods of mathematical modeling in geology; <p>know:</p> <ul style="list-style-type: none"> - basic mathematical methods used in geology for statistical analysis and modeling of geological objects; - main hypotheses and criteria for their verification; - basic principles of mathematical modeling of geological objects and processes; - types of mathematical models and features of their application in various fields of geology; <p>be able to:</p> <ul style="list-style-type: none"> - to formulate geological problems in a form convenient for their solution using mathematical methods and modern computer technology; - statistically evaluate geological objects; - to choose the optimal schemes for processing analytical and graphic data using mathematical methods; - choose mathematical models that most fully reflect the properties of geological objects and the type of problem being solved 		
Form of final control	Written exam - 120 min.		
Conditions for obtaining loans	- Attending a lecture;		
Module duration	- Fulfillment of assignments for laboratory (practical) work and on the topics of SIWT.		
Literature	Базовая литература	Дополнительная литература	
	[1] Каждан А.Б., Гуськов О.И. Математические методы в геологии. Учебник для вузов. – М.: Недра, 1990. – 252 с.	[4] Грановская Н.В., Наставкин А.В. Сборник лабораторных и самостоятельных занятий по «Математические методы моделирования в геологии» для студентов геологических специальностей географического факультета. – Ростов н/Дону: 2006. – 100 с.	
	[2] Мартянова А.Е. Математические методы моделирования в геологии. Часть I: Учебное пособие для студентов очной и заочной форм обучения специальности 130304.65 «Геология нефти и газа». – Астрахань: АГТУ, 2008. 200 с.	[5] Лялин А.В. Сборник задач для лабораторных и самостоятельных занятий по дисциплине «Математические методы моделирования в геологии». Для студентов геологических специальностей географического факультета. – Ставрополь: 2006. – 49 с.	
	[3] Мартянова А.Е. Математические методы моделирования в геологии. Часть II: Учебное пособие для студентов очной и заочной форм обучения специальности 130304.65 «Геология нефти и газа». – Астрахань: АГТУ, 2008. 180 с.	[
Update date	1 semester		
Module name and code	Module.GEO443 Fundamentals of subsoil use		
Responsible for the module	PhD Mustapaeva S.N.		
Module type	profile, mandatory module		
Module level	BA		
Number of hours per week	3		
Amount of credits	5 (5 ECTS)		
Form of study	full-time		
Semester	5		
Number of students	120		
Module Prerequisites	General and Historical geology		
Module content	<p>EMCD GEO443 Fundamentals of subsoil use</p> <p>The legislative framework for subsoil use in Kazakhstan. Ownership of the subsoil, minerals and minerals. Competence of executive bodies in the field of subsoil use. Subsoil use right: types and subjects of law, its emergence, provision and transfer. The procedure for granting the right to conduct exploration, mining, combined exploration and mining. Types, terms, conclusion and execution of the contract. Work program as an integral part of the contract. Protection of the subsoil and the environment. Ecological basis for subsoil use operations. Security of the population and staff. State Subsoil Fund Rights and obligations of the subsoil user. Ownership of subsoil information. Peculiarities of legal relations during exploration and production of oil, groundwater, precious metals and</p>		

	precious stones, and other minerals. Subsoil users taxation		
Learning Outcomes	<p>Student:1) know: main goals, objectives and principles of subsoil use in the Republic of Kazakhstan. Know all types of subsurface use operations, sources of their financing, and the system of taxation of subsurface users. Know the contents of the state subsoil Fund of the Republic of Kazakhstan.</p> <p>2) be able to: draw up the necessary documents for obtaining the subsoil use right and the draft of the subsoil use Contract.</p> <p>3) possess skills: conducting monitoring of subsurface use operations.</p>		
Form of final control	Written exam - 120 min.		
Conditions for obtaining loans	- Attending a lecture;		
Module duration	- Fulfillment of assignments for laboratory (practical) work and on the topics of SIWT.		
Literature	<p>Базовая литература</p> <p>1. Кодекс Республики Казахстан «О недрах и недропользовании» (2017 г.)</p> <p>2. Закон Республики Казахстан «О недрах и недропользовании», 2010 года с изменениями и дополнениями, внесенными на декабрь 2017года.</p> <p>3. Казахстанский кодекс по публичной отчетности о результатах геологоразведочных работ, минеральных ресурсах и минеральных запасах КОДЕКС KAZRC</p> <p>7. Периодическая литература, посвященная вопросам недропользования</p>	<p>Дополнительная литература</p> <p>4. Учебник (рукопись) «Основы недропользования» Асанов, А.А. Жунусов. Астана, 2018</p> <p>5. Концепция развития геологической отрасли Казахстана до 2030года</p> <p>6. Стратегия Казахстан—2050, план нации (2015).</p>	
Update date	1 semester		
Module name and code	Module.GE0430 Hydrogeology with the basics of engineering geology		
Responsible for the module	Auelhan E. PhD		
Module type	profile, mandatory module		
Module level	BA		
Number of hours per week	2		
Amount of credits	4 (4 ECTS)		
Form of study	full-time		
Semester	6		
Number of students	120		
Module Prerequisites	General geology		
Module content	<p>EMCD GE0430 Hydrogeology with the basics of engineering geology</p> <p>The science of groundwater as a relatively independent geological system, the underground hydrosphere, which is part of a higher order system - the hydrosphere; about hydrogeological processes as a manifestation of the interaction and unity of all waters and geospheres of the Earth; about the geological environment as a system of interaction between the lithosphere and the technosphere, lithosphere, atmosphere, hydro, biosphere, and about engineering-geological processes - as an expression of the named interaction; on the main problems of hydrogeology and engineering geology and their relationship with the system of geological knowledge.</p>		
Learning Outcomes	<p>Student:1) know:</p> <ul style="list-style-type: none"> - characteristics of underground waters, their properties and their relationship to each other, - connection to the atmosphere and underground hydrosphere, - area of nutrition and their distribution; - the purpose of their application. <p>2) be able to:</p> <ul style="list-style-type: none"> - conduct searches, exploration and evaluation of operational reserves of underground water for the purposes of water supply of settlements, agricultural and industrial enterprises; <p>3) possess skills:</p> <p>providing a scientific basis for long-term planning of exploration, hydrogeological and other works.</p>		
Form of final control	Written exam - 120 min.		
Conditions for obtaining	- Attending a lecture;		

loans	
Module duration	- Fulfillment of assignments for laboratory (practical) work and on the topics of SIWT.
Literature	- Exam
Update date	1 semester
Module name and code	Module.GEO445 Oil and gas Geology
Responsible for the module	PhD Ensepbayev T.A.
Module type	Profile, mandatory module
Module level	BA
Number of hours per week	3
Amount of credits	5 (5 ECTS)
Form of study	full-time
Semester	5
Number of students	120
Module Prerequisites	General and Historical Geology
Module content	EMCD GEO445 Oil and gas Geology The geology of oil and gas studies the origin, conditions of occurrence and the geological history of combustible minerals. Gives knowledge about reservoir rocks and tires, natural reservoirs for oil, gas and water, traps, deposits and oil and gas fields. The conditions of oil and gas formation and oil and gas accumulation, migration, concentration and preservation of hydrocarbons in traps, as well as geological and geophysical methods of searching for oil and gas are considered. On this basis, a scientific base is being developed for prospecting, exploration and development of oil and gas accumulations.
Learning Outcomes	Student:1) know: the main stages of geological development of oil and gas provinces, the main similarities and differences of the main structural and tectonic zones. 2) be able to: read the legend of geological and tectonic maps of different scales, identify areas of localization of oil and gas areas; perform geometrization of oil and gas deposits; 3) possess skills: read the legend of geological and tectonic maps of different scales, identify areas of localization of oil and gas areas; perform geometrization of oil and gas deposits
Form of final control	Written exam - 120 min.
Conditions for obtaining loans	- Attending a lecture;
Module duration	- Fulfillment of assignments for laboratory (practical) work and on the topics of SIWT.
Literature	- Exam
Update date	1 semester

Module designation	GEO436 – Geoinformation technologies in geology
Semester(s) in which the module is taught	3
Person responsible for the module	Asubayeva S.K., Mamanov Y.Zh., Omarova G.M.
Language	Kazakh, Russian
Relation to curriculum	
Teaching methods	Lecture, seminar
Workload (incl. contact hours, self-study hours)	Total workload: 5 credits Contact hours: 1 lecture, 1 seminar
Credit points	3
Required and recommended prerequisites for joining the module	No
Module objectives / intended learning outcomes	The purpose of the course: to give theoretical and practical knowledge in the field of geoinformation system in relation to the tasks of geology. Development of practical skills in modern geographic information systems. Course objective: When studying the discipline, specialists should learn digital data processing technologies, technologies for creating and updating information databases, creating digital geological maps and plans

Content	-The concept of geoinformatics. The concept of spatially-referenced information and the main ways to obtain it. Data of geographic information systems and ways to create a digital basis for geographic information systems. GIS software. Technologies for creating maps of geological content in geographic information systems. Remote basis of geological mapping.
Examination forms	writing, tickets
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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; <p>mandatory use of electronic gadgets in the classroom, which is welcome, but it is unacceptable to use them in the exam..</p>
Reading list	<p>Asubayeva S.K. Application geoinformation systems in geology. Almaty, 2017. 110 p. Ananiev Yu.S. geoinformation systems. Tutorial. -Tomsk.-2003. Berlyant A.M. Cartography: M.: Aspect Press, 2002. - 336 page</p>

Module designation	GEO440 Geological mapping
Semester(s) in which the module is taught	Autumn semesters
Person responsible for the module	Kembayev Maksat Kenzhebekuly Omarova Gulnara Magauyanovna
Language	Russian, Kazakh
Relation to curriculum	Elective disciplines
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 – 2 credit, practice - 1 credits), contactless - 2 credits (SROP, SRO)
Required and recommended prerequisites for joining the module	As a result of mastering the discipline, students should 1) know: methods of field Geology, methods of geological survey and preparation of geological maps, techniques and technology of field geological research. 2) be able to: read geological maps, build geological sections, conduct geological surveys and make geological maps of various scales, decipher the materials of aerial and space surveys. 3) possess skills: preparation of geological maps of various scales, geological survey, analysis of available geological materials and identification of prospects for the studied areas in relation to the discovery of minerals.
Module objectives / intended learning outcomes	Course goal: mastering techniques and methods of geological survey, as one of the main means of knowing the geological structure of the earth's crust; acquisition of skills for analyzing existing geological materials and identifying the prospects of the studied areas in relation to the discovery of minerals; familiarization with the content of General searches during geological survey; obtaining knowledge on the organization and production of geological survey works of different scales and the main requirements imposed on them; formation of skills to work with geological graphics and prepare reporting materials. Course objective: - getting students a solid knowledge of the theory and practice of geological survey and geological mapping; - familiarization with special methods and features of surveying in different geological and geographical conditions and in areas of development of different origin of rocks; - mastering the methods of facial-genetic, structural and historical-geological analysis.
Content	Development of methods of field Geology, geological survey and geological maps, equipment and technology of field geological research. Special methods of geological surveys in the areas of development of sedimentary, volcanic, Intrusive and metamorphic rocks. Features of shooting in different geological and geographical conditions. Analysis of the geological structure of the block of the earth's crust, preparation of geological graphics and explanatory notes to it. Methods of geological interpretation of aerial and space survey materials. Mastering the methods of facial-genetic, structural and historical-geological analysis
Examination forms	Examination cards
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	Bespalov V.F. Geological structure of the Kazakh SSR. Science of KazSSR, Almaty, 1971. Field geology. Reference guide. Undered. In V Lavrov, A.S. Kupman 2 books. L.: Nedra, 1989. 399 p. Methodological guide for geological survey scale 1:50000. Issue. 14. Geological documentation for geological surveys and prospecting works. Bourdais A.I., Vysotsky A.A., Oleinikov A.N. and f. L.: Nedra, 1984. 270 p.

Module designation	GRO441 Crystaloptics
Semester(s) in which the module is taught	Autumn semesters for 3 courses
Person responsible for the module	Baysalova Akmaral Omarkhanovna
Language	Russian, Kazakh
Relation to curriculum	Elective disciplines
Teaching methods	Lecture, laboratory
Workload (incl. contact hours, self-study hours)	5 credits
Credit points	Lecture-1 credit, practice-2 credit, contactless - 2 credits (SROP, SRO)
Required and recommended prerequisites for joining the module	<p>As a result of mastering the discipline, students must</p> <p>1) know:</p> <ul style="list-style-type: none"> - history, subject, tasks and methods of studying igneous, metamorphic and metasomatic rocks; - fundamentals of crystal optics and methods of crystal-optical diagnostics of minerals, their optical constants; - modern scientific ideas about the processes of magmatism, metamorphism and metasomatism; - classification and main types of igneous, metamorphic, and metasomatic rocks; - microscope device; - the principle of constructing an optical indicatrix; <p>2) be able to:</p> <ul style="list-style-type: none"> - use a polarizing microscope in transmitted light; - generalize the parameters of minerals and diagnose them under a microscope (microstructures and microtextures), various rocks. - to reconstruct the conditions of formation of species and the primary composition of magma; - analyze mineral associations - interpret the obtained data on rocks in accordance with modern classifications. <p>3) possess skills:</p> <ul style="list-style-type: none"> - organizational skills; - ability to find a common language and work in a team; - ability to make quick decisions and self-confidence
Module objectives / intended learning outcomes	<p>The purpose of the course: crystal optics, obtaining knowledge about methods of studying rocks using a polarizing microscope and skills in drawing up petrographic descriptions.</p> <p>Course objective:</p> <ul style="list-style-type: none"> - teach students the basics of crystal optics; - instill in them practical skills of working with a polarizing microscope; - teach students to use the main methods of crystal-optical research; - train them to identify minerals under a microscope
Content	<p>Polarized light and polarizers; polarizing microscope; refraction and birefringence of light in minerals; related optical properties of minerals and their determination; petrographic characteristics of ultrabasic, basic, medium, acidic and foid rocks; conditions of formation and study of them using a polarizing microscope; sedimentary rocks, petrographic characteristics of clastic, clay, chemogenic and biogenic rocks, conditions of formation and study of them using a polarizing microscope; petrographic characteristics of metamorphic rocks of cataclastic contact-thermal, regional metamorphism and metasomatites and their study using a polarizing microscope</p>
Examination forms	Examination cards
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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	<ol style="list-style-type: none"><li data-bbox="550 174 1530 241">1. Bekbotaev A.T., Bekbotaeva A.A. Microscopy of petrogenic minerals. Almaty: Evero. 2017<li data-bbox="550 241 1530 331">2. Michael M. Raith, Peter Raase & Jürgen Reinhardt. Guide to Thin Section Microscopy. Publisher: Raith, Raase & Reinhardt. Language: English. P. 127. Isbn-13: 9783000376719. Publish date: 2012-02-xx. Edition 2.
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Module designation	GEO444 Geological and industrial types of mineral deposit
Semester(s) in which the module is taught	Spring Semesters
Person responsible for the module	Baybatsha Adilkhan Begdyldauly Bekmukhamteva Zauze Arstanovna
Language	Russian, kazakh
Relation to curriculum	Elective disciplines
Teaching methods	Lecture, Laboratory classes, SROP, SRO
Workload (incl. contact hours, self-study hours)	30 academic hours Lecture-15h, CPS- 15 hours
Credit points	2 credits: contact - 2 (lecture - 2 credit, laboratory- 1 credits), contactless - 2 credit (SROP, SRO)
Required and recommended prerequisites for joining the module	As a result of mastering the discipline, students must 1) know: features of the geological structure, geological and structural conditions of localization of the main types of industrial deposits of various types of metallic and non-metallic minerals. 2) be able: according to the geological and structural features, the material composition of ores and the characteristic complex of host rocks, to attribute this Deposit to a certain geological and industrial type. 3) have the skills to determine its geological and industrial type based on the existing collections of ores and host rocks, the given geological and structural features of deposits.
Module objectives / intended learning outcomes	The purpose of the course: to form students ' knowledge in the field of industrial use of various types of metal and non-metal minerals, consumer requirements for their quality and quantity, the principles of technological and industrial typing of ores, and the allocation of industrial and genetic types of minerals by types of minerals. Course objective: - familiarization of students with the state and prospects of development of the mineral resource base of the Republic of Kazakhstan; - familiarization of students with industrial classifications of mineral deposits; - study of the geological structure of deposits and morphology of ore bodies; - study of mineral and chemical composition of ores, their application in industry; - study of the main requirements of the industry for mineral deposits; - introducing students to examples of industrial and genetic types of mineral deposits.
Content	State and prospects of development of the mineral resource base of Kazakhstan. Industrial types of deposits. Industrial classification of deposits. Basic industry requirements for mineral deposits. Industrial types of ferrous metal deposits. Industrial types of deposits of the alloying metals. Industrial types of non-ferrous metal deposits. Industrial types of precious metal deposits. Industrial types of deposits of radioactive elements. Industrial types of rare metal deposits. Industrial types of deposits of non-metallic minerals. Industrial types of fossil fuel deposits
Examination forms	Examination cards.
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	1. V. Avdonin, V.I. Starostin Geology of minerals. M: Publishing Center "Academy", 2010. 385 p. 2. Smirnov V.I. Geology of minerals. - M.: Nedra, 1989. 326 p. 3. V.A. Ermolov, G.B. Popova and others. Deposits minerals: textbook. for universities; Moscow state bugle un-t. - 5th ed., erased. - M.: MGGU, 2013. – 570 4. Lebedev G.V. Search and exploration of useful deposits fossils: textbook. allowance: in 2 volumes / Perm. statenat. research un-t. - Perm, 2017. - Vol. 1: Forecasting and prospecting for deposits. – 220 s. 5. Starostin V.I., Ignatov P.A. Geology Minerals: Proc. for universities; Moscow state. M. V. Lomonosov. - M.: Acad. project: Mir, 2006. - 512 p.

Module designation	GPH181 Theoretical foundations and applied aspects of GIS
Semester(s) in which the module is taught	autumn semester
Person responsible for the module	Istekova S.A.
Language	Russian, Kazakh
Relation to curriculum	Elective disciplines
Teaching methods	Lecture, practical classes, SRO
Workload (incl. contact hours, self-study hours)	5 - 2/1/0/2
Credit points	Lecture – 15 credits Practical classes – 30 credits
Required and recommended prerequisites for joining the module	no
Module objectives / intended learning outcomes	The purpose of the course: the formation of knowledge about the physical nature and field of application of electrical, radiometric, acoustic and other geophysical methods for studying oil and ore wells.
Content	The basics of integrating geophysical research methods for specific types of fields are given. The technique and technique of GIS, technical conditions for carrying out GIS, principles and methodology of integration are described. Methods for studying the technical condition of wells and methods for monitoring field development are considered. As part of the course, the student will master the theoretical foundations and applied aspects of geophysical methods for well survey (GIS) in prospecting and exploration of mineral deposits, the physical essence of GIS methods, principles of work, types of equipment currently used for applications of methods for geophysical research of wells. Basic knowledge and skills in the field of geophysics, geology, petrophysics, physics, as well as well survey methods in prospecting and exploration of mineral deposits will be presented
Examination forms	Exam tickets
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	

Module designation	GPH180 Geophysical survey of wells of uranium deposit
Semester(s) in which the module is taught	spring semester (2nd semester)
Person responsible for the module	Aliakbar M.
Language	Russian, kazakh
Relation to curriculum	Elective disciplines
Teaching methods	Lecture, laboratory classes, SROP, SRO
Workload (incl. contact hours, self-study hours)	5-2/1/0/2
Credit points	Lecture – 15 credits Practical classes – 30 credits
Required and recommended prerequisites for joining the module	GE0411 Geophysical methods of prospecting and exploratio
Module objectives / intended learning outcomes	The purpose of the course: is to study the increase in the geological efficiency of geophysical work in uranium deposits of the infiltration type
Content	This discipline forms knowledge about the physical nature and field of application of well logging methods (GIS) in prospecting and exploration of uranium deposits. Highlights the role of GIS in solving geological problems - lithological and stratigraphic dissection of well sections, allocation of uranium deposits and determination of their physical properties and cross-well correlation. Explains the geochemical and nuclear-physical properties of uranium, petrophysical models of uranium deposits of the main industrial types, geophysical research methods in wells during the exploration and development of uranium deposits by the method of underground borehole leaching
Examination forms	Exam tickets
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	

Module designation	GEO451 Computer technologies in Geology	
Semester(s) in which this module is taught	autumn	
The person responsible for the module	Asubayeva Saltanat Kalykbayevna Mamanov Yerkozha Zholamanovich	
Language	Kazakh, Russian	
Relation to the curriculum	Elective disciplines	
Teaching methods	2 credit lectures / 2 credits of practical training	
Workload (incl. contact hours, hours of independent work)	5-2/1/0/2	
Credits	5 credits	
Necessary and recommended prerequisites of the module	GE0429 Fundamentals of Prospecting and Exploration of Mineral Deposits	
Module objectives/expected learning outcomes	<p>The purpose of the course: to provide theoretical and practical knowledge in the field of computer technology in relation to the problems of Geology.</p> <p>Course objective:</p> <ul style="list-style-type: none"> -provide theoretical and practical knowledge in the field of computer technology in relation to the problems of Geology; -development of preliminary knowledge about the basic concepts of construction -geological maps, sections, stratigraphic columns, etc.; -deepening technological education in the field of computer technology; -getting General ideas about the use of a computer in Geology; -developing practical skills in modern Geology. 	
Content	<p>Creation of geological maps in the geological industry, which are qualitatively more advanced cartographic models that reflect modern knowledge about the geological structure of individual blocks of the earth's crust and are the fundamental geological basis for creating all types of specialized maps of geological content. The discipline "Computer technologies in Geology" allows students to acquire knowledge about the methods of digital mapping and spatial reference; ability to work in design programs for drawing stratigraphic columns and diagrams that do not require spatial reference; skills in drawing digital maps of various contents and purposes; competently work with MapInfo, CorelDraw programs.</p>	
Examination forms	Exam tickets	
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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	Base references	Additional references
	Ananyev Yu.S. Geoinformation systems. Study guide. - Tomsk.- 2003.	L.K.Trubin. Geoinformation systems. Lecture notes. Novosibirsk 2012. – 35 p.
	Berlyant A.M. Cartography: M.: Aspect Press, 2002. - 336	"What is ArcGIS, A brief overview of ArcMap", description of the software products of the ArcGIS- ESRI family, Translation Date+, 2001-2004.
	Melita Kennedy and Steve Kopp. Cartographic projections. - ESRI, Translated by Date+, 2002.	

Module designation	GEO 457 Applied geochemical research
Semester(s) in which this module is taught	autumn
The person responsible for the module	<i>Arshamov Yalkunzhan Kamalovich</i>
Language	Kazakh, Russian
Relation to the curriculum	Elective disciplines
Teaching methods	2 credit lectures / 2 credits of practical training
Workload (incl. contact hours, hours of independent work)	5-2/1/0/2
Credits	5 credits
Necessary and recommended prerequisites of the module	GE0429 Fundamentals of prospecting and exploration of mineral deposits
Module objectives/expected learning outcomes	<p>The purpose of the course: to familiarize students with and understand the theoretical foundations of geochemical methods, on the basis of which the most rational method of searching and detecting mineral deposits can be selected and applied depending on specific geological and landscape-geochemical conditions, as well as to acquire practical skills in interpreting and processing geochemical data.</p> <p>Course objective:</p> <ul style="list-style-type: none"> - formation of students' ideas about the geochemical bases of searches, geochemical search signs of deposits and methods of geochemical search operations; - mastering methods for assessing migration conditions and concentration of chemical elements, identifying geochemical barriers; - the study of the geochemical classifications of the chemical elements according to various criteria; - mastering methods of isotope Geochemistry; - analysis of geochemical maps using GIS technologies; - mastering the technique of geochemical searches in various landscape and climatic zones; - carrying out calculation of geochemical resources of the subsoil areas.
Content	<p>Geochemical methods for prospecting for mineral deposits are based on the study of the distribution patterns of elements and their compounds found in natural conditions. Easy-to-discover deposits have been discovered, so the prospects for opening new objects are associated with the Fund of "hard-to-discover deposits", which include deposits: overlaid with loose deposits; primary and secondary minerals of ores, whose ore bodies are visually indistinguishable from the host rocks. The detection of these types of deposits is made by geochemical methods of search.</p>
Examination forms	Exam tickets
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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	<ol style="list-style-type: none"> 1. Arshamov Ya.K. Paidaly kazba kenoryndaryn geohimiyalyk izdeu adisteri. Oku kuraly. – Almaty: "KazUTU", 2015. – 170 b. 2. Alekseenko V.A. Geochemical methods of prospecting for mineral deposits. Textbook. – Second edition, reprint. and additional – M.: Logos, 2000. – 354 p. 3. Voroshilov V.G. Geochemical methods of prospecting for mineral deposits. Tutorial. TPU. – Tomsk: TPU Publishing House, 2011. -104 p.

Module designation	GEO 453 <i>Geochemical methods of prospecting for mineral deposits</i>
Semester(s) in which this module is taught	<i>autumn</i>
The person responsible for the module	<i>Arshamov Yalkunzhan Kamalovich</i>
Language	<i>Kazakh/ Russian</i>
Relation to the curriculum	Elective disciplines
Teaching methods	2 credits lectures / 1 credit practises classes / 2 credits credits of independent work
Workload (incl. contact hours, hours of independent work)	5-2/1/0/2
Credits	<i>5 credits</i>
Necessary and recommended prerequisites of the module	GE0429 Fundamentals of prospecting and exploration of mineral deposits
Module objectives/expected learning outcomes	The objectives of mastering the discipline "Geochemical methods of prospecting" is to familiarize with the geochemical methods of prospecting for mineral deposits, which play an important role at all stages of the exploration process. The discipline involves the study of the possibilities of geochemical methods and the sequence of their implementation.
Content	Theoretical foundations of geochemical prospecting methods. Classification of geochemical prospecting methods
Examination forms	Exam tickets
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	1. Arshamov Ya.K. Paidaly kazba kenoryndaryn geohimiyalyk izdeu adisteri. Oku kuraly.– Almaty: "KazUTU", 2015. – 170 b. 2. Alekseenko V.A. Geochemical methods of prospecting for mineral deposits. Textbook. – Second edition, reprint. and additional – M.: Logos, 2000. – 354 p. 3. Voroshilov V.G. Geochemical methods of prospecting for mineral deposits. Tutorial. TPU. – Tomsk: TPU Publishing House, 2011. -104 p

Module designation	GEO452 Laboratory methods of mineral research
Semester(s) in which the module is taught	Spring
Person responsible for the module	Mamanov Yerkozha Zholamanovich Asubayeva Saltanat Kalykbayevna Omarova Gulnara Magauvyanovna
Language	Kazakh/ Russian
Attitude towards the curriculum	Elective disciplines
Teaching methods	1 credits lectures / 2 credit laboratory classes / 2 credits credits of independent work
Workload (incl. contact hours, self-employment hours)	5 (1/2/0/2)
Credit scores	5 <i>credits</i>
Required and Recommended Prerequisites for Attaching to the Module	GEO 434 Petrography
Module objectives/intended learning outcomes	<p>The purpose of the course: to Gain students ' knowledge on microscopic study of ores of various genetic types of deposits. To master the theory and practice of microscopic investigation of ores. Teach students the skills of self-diagnosis of ore-forming minerals in reflected light and the ability to use the definition tables, which can be used to determine the mineral under the microscope. To impart basic techniques in the study of textural and structural analysis, paragenetic mineral associations, and mineral typomorphism. Introduce modern methods of mineralogical research, which open up great opportunities in solving genetic and applied problems.</p> <p>Course objective:</p> <ul style="list-style-type: none"> - determination of the mineral composition of ores and finding out the regularities of its change in different parts of the ore body; - study of the typomorphism of the main ore-forming minerals; - study of distribution patterns and determination of the dimension of valuable components in ores and main ore minerals; - identification of different types of ores and their constituent paragenetic mineral associations, their placement in the field; - characteristics of the structure (texture and structure) of the ore; - finding out the sequence of mineral formation
Content	Special discipline on methods of diagnostics of mineral substances, studies of the physical and chemical composition of ores, their structural and textural and other features that determine their quality and affect the technology of extraction and processing. Ore microscopy, spectral and x-ray structural analysis, thermal analysis, petrophysical methods, study of gas-liquid inclusions, cryometry, decrepitation, concentrate method: their capabilities and requirements for sample quality. Applications of these methods in practical Geology and methodology.
Examination forms	Exam tickets
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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..

List of literature	

Module designation	GEO455 Fundamentals of geotectonics
Semester(s) in which this module is taught	Autumn
The person responsible for the module	Kembayev Maksat Kenzhebekuly Satibekova Sandugash Boranbayevna
Language	Kazakh/ Russian
Relation to the curriculum	Elective disciplines
Teaching methods	2 credits lectures / 1 credit practises classes / 2 credits credits of independent work
Workload (incl. contact hours, hours of independent work)	5 (2/0/1/2)
Credits	5 credits
Necessary and recommended prerequisites of the module	GEO 432 Structural Geology
Module objectives/expected learning outcomes	<p>The purpose of the course: students to acquire knowledge on the structural features and development of tectonic structures of various ranks; the deep structure of the Earth and the evolution of the structure of lithospheric plates; the study of causal relationships of tectonic processes occurring in the bowels of the planet, with the structure of the earth's crust and upper mantle.</p> <p>Course objective: study of the causes, features of manifestation, course of action tectonic movements in the context of the upper hard shells of the Earth - in the earth's crust and lithospheric mantle, as well as the identification of the time and sequence of the laying, development and stabilization of tectonic structures of the earth's crust of various ranks (structural elements of the earth's crust) formed as a result of tectonic stresses and in various tectonic modes.</p>
Content	<p>A branch of geology that studies the structure, movements and deformation of the lithosphere, and its development in connection with the development of the Earth as a whole. Geodynamics is a new scientific discipline that establishes and explores the forces that generate processes that change the composition and structure of the shells of solid Earth. Its main method is modeling: mathematical and physical. Geotectonics in solving the most common issues - the causes of tectonic movements, deformations and the development of the structure of the lithosphere as a whole, is interfaced with geodynamics, since it is the latter that studies forces acting on a global scale.</p>
Examination forms	Exam tickets
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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..
List of literature	<ol style="list-style-type: none"> 1. V.E. Hain, M.G. Lomize. Geotectonics with the basics of geodynamics. Moscow, 2010. 2. Geotectonics and Geodynamics. N.S. Seitov; Kaz. national Tech. K. I. Satpayev Univ. - Almaty: KazNTU, 2013. - 173 p. 3. Khain V.E., Lomize M.G. Geotectonics with the basics of geodynamics. Moscow, Publishing house "KDU", 2005. 560 p 4. Geotectonics. B.M. Abishev; K. I. Satbayev atyndagy Kaz. ult. tech. un-ti.-Almaty : KazUTU, 2003.- 102 b. 5. V.P. Gavrilov. Geodynamics. Moscow, 2007. 6. S.V. Aplonov. Geodynamics. St. Petersburg, 2001. p.

Module designation	GEO184 Geological assessment of mineral resources and reserves	
Semester(s) in which this module is taught	Autumn	
The person responsible for the module	Arshamov Yalkunzhan Kamalovich	
Language	<i>Russian/Kazakh</i>	
Relation to the curriculum	Elective disciplines	
Teaching methods	2 credits lectures / 1 credit practises classes / 2 credits credits of independent work	
Workload (incl. contact hours, hours of independent work)	5 (2/0/1/2)	
Credits	5 credits	
Necessary and recommended prerequisites of the module	GEO429 Fundamentals of Prospecting and Exploration of Mineral Deposits	
Module objectives/expected learning outcomes	<p>The purpose of the course: comprehensive knowledge of the composition, structure, structure and texture, classification of igneous, sedimentary, metamorphic, metasomatic rocks, nomenclature and conditions of formation of rocks and their connection with mineral deposits.</p> <p>Course objective:</p> <ul style="list-style-type: none"> - Study of igneous rocks: formation, material composition and structure. Structures and textures of igneous rocks. - Study of sedimentary rocks: formation, material composition, structure. Textures and structures of sedimentary rocks. Classification of sedimentary rocks. - Study of metamorphic rocks: factors and types of metamorphism, material composition, structure. Textures and structures of metamorphic rocks. <p>Types of metamorphism: cataclastic, contact-thermal, regional, metasomatosis.</p>	
Content	<p>Fundamentals of research and use (geological and economic assessment) of subsoil in the Republic of Kazakhstan. Laws and normative legal acts of the Republic of Kazakhstan - guidance materials on the geological and economic assessment of MPI. Stages and stages of exploration. Criteria of industrial value MPI. Intelligence Methods. Assessment of the variability of mineral properties. Technical means of geological study in the evaluation and exploration of mineral deposits. Classification of mineral reserves. Conditions for mineral raw materials and their impact on reserves and quality. Appointment of condition. Calculation of stocks of solid minerals. Examination of geological materials. Comparison of exploration data with the results of field exploitation.</p>	
Examination forms	Exam tickets	
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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.. 	
List of literature	Base references	Additional references
	Collection of guidance materials on geological and economic assessment of mineral deposits of the Republic of Kazakhstan, Kokshetau, 2002.	Kazhdan A.B. Prospecting and exploration of mineral deposits. Production of geological exploration. – M.: Nedra, 1985.
	Porotov G.S. Exploration and geological and economic assessment of mineral deposits. – S-Pb. – 2004. – 244 p.	Pogrebitsky E.O., Paradeev S.V., Porotov G.S., etc. Prospecting and exploration of mineral deposits. – M.: Nedra, 1977.
	Kazhdan A.B., Kobakhidze L.P. Geological and economic assessment of mineral deposits. – M.: Nedra, 1985. – 205 p.	Avdonin V.V., Ruchkin G.V., Shatagin N.N. and others. Prospecting and exploration of mineral deposits. Textbook for universities. Edited by V.V. Avdonin. – M.: Academic project: Mir

		Foundation, 2007. - 540 p.
	ollection of guidance materials on geological and economic assessment of mineral deposits of the Republic of Kazakhstan, Kokshetau, 2002.	

Module designation	GEO454 Geological and economic assessment of mineral deposits															
Semester(s) in which this module is taught	Autumn															
The person responsible for the module	Arshamov Yalkunzhan Kamalovich															
Language	<i>Russian/Kazakh</i>															
Attitude to the curriculum	Elective disciplines															
Teaching methods	2 credits lectures / 1 credit practises classes / 2 credits credits of independent work															
Workload (incl. contact hours, self-employment hours)	5 (2/0/1/2)															
Credit scores	5 credits															
Necessary and recommended prerequisites for joining the module	GEO429 Fundamentals of Prospecting and Exploration of Mineral Deposits															
Module objectives/expected learning outcomes	The purpose of the discipline: teaching students how to correctly assess mineral deposits, including the assessment of geological factors (quantity, quality, technological properties of minerals, mining and geological conditions of development and the geographic and economic position of deposits), as well as the fundamental features of mining based on mining rents, mineral markets and other contemporary economic indicators.															
Content	Introduction. Basics of research and use (geological and economic assessment) of subsoil in the Republic of Kazakhstan. Laws and regulations of the Republic of Kazakhstan - guidelines for geological and economic assessment of mineral deposits. Stages and stages of geological exploration. Criteria for the industrial value of mineral deposits. Intelligence methods. Assessment of the variability of properties of minerals. Technical means of geological study in the assessment and exploration of mineral deposits. Classification of mineral reserves. Conditions for mineral raw materials and their impact on reserves and quality. Appointment of conditions. Calculation of reserves of solid minerals. Examination of geological materials. Comparison of exploration data with the results of field exploitation.															
Examination forms	<p>Each control work except tests is evaluated according to 4 criteria:</p> <ul style="list-style-type: none"> - accuracy and accuracy – 30% (how accurately and accurately the work is calculated); - creativity and creativity – 30% (how and how the work is presented); - completeness and maturity – 40% (how deeply, logically and structurally the work is solved); - originality – a special coefficient of 1.0, 0.5 or 0 is used. <p>The exam is in writing (a ticket of 3 questions), there is a zero ticket in the form of a guide for passing the exam on the website, login under the student's username.</p>															
Requirements for training and exams	<p>Maximum marks by the tasks types</p> <table border="1"> <tr> <td>Completion of tasks (IWUI)</td> <td>6 IWUI 2 points = 12</td> </tr> <tr> <td>Laboratory work</td> <td>8 works 4 points = 32</td> </tr> <tr> <td>1st intermediate certification (Midterm)</td> <td>M-1: 6 points=6</td> </tr> <tr> <td>Course project</td> <td>1 IWS 6 points=6</td> </tr> <tr> <td>2nd final certification (Endterm)</td> <td>M-2: 4 points=4</td> </tr> <tr> <td>Final exam</td> <td>40</td> </tr> <tr> <td>Total</td> <td>100</td> </tr> </table>		Completion of tasks (IWUI)	6 IWUI 2 points = 12	Laboratory work	8 works 4 points = 32	1st intermediate certification (Midterm)	M-1: 6 points=6	Course project	1 IWS 6 points=6	2nd final certification (Endterm)	M-2: 4 points=4	Final exam	40	Total	100
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Module designation	GE0458 Mine geology															
Semester(s) in which this module is taught																
The person responsible for the module																
Language	<i>Russian/Kazakh</i>															
Relation to the curriculum	Elective disciplines															
Teaching methods	2 credits lectures / 1 credit practises classes / 2 credits credits of independent work															
Workload (incl. contact hours, hours of independent work)	5-2/1/0/2															
Credits	<i>5 credits</i>															
Necessary and recommended prerequisites of the module	GEO429 Fundamentals of Prospecting and Exploration of Mineral Deposits															
Module objectives/expected learning outcomes	<p>Course goal: To teach knowledge, skills, and decision-making in geological support and in the provision of exploration and mining.</p> <p>Course Objective: comprehensive geological study of the exploited field and its individual parts and blocks for the correct solution of all mining and geological issues related to technically correct and appropriate development of the field with the most complete and comprehensive use of mineral resources and to extend the life of mining enterprises due to the increase in additional reserves.</p>															
Content	<p>The subject of the study of mine geology is prepared for industrial development and exploited mineral deposits. Within the mining allotments of mines of mines and quarries, operational exploration of deposits is carried out with the aim of providing mining enterprises with explored mineral reserves. During operational exploration and development of deposits, geological documentation and mineral testing will be performed. During the exploitation of deposits, the movement of reserves, losses and dilution of minerals is counted and accounted for, and exploration and exploitation data are compared.</p>															
Examination forms	<p>Each control work except tests is evaluated according to 4 criteria:</p> <ul style="list-style-type: none"> – accuracy and accuracy – 30% (how accurately and accurately the work is calculated); – creativity and creativity – 30% (how and how the work is presented); – completeness and maturity – 40% (how deeply, logically and structurally the work is solved); – originality – a special coefficient of 1.0, 0.5 or 0 is used. <p>The exam is in writing (a ticket of 3 questions), there is a zero ticket in the form of a guide for passing the exam on the website, login under the student's username.</p>															
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Course project	1 IWS 6 points=6															
2nd final certification (Endterm)	M-2: 4 points=4															
Final exam	40															
Total	100															
List of literature																

Module designation	GE0461 Geomorphology and geology of anthropogenic																			
Semester(s) in which this module is taught	Autumn																			
The person responsible for the module	Nigmatova Saiyda Arapovna																			
Language	<i>Russian/Kazakh</i>																			
Relation to the curriculum	Elective disciplines																			
Teaching methods	2 credits lectures / 1 credit practises classes / 2 credits credits of independent work																			
Workload (incl. contact hours, hours of independent work)	5 (2/0/1/2)																			
Credits	5 credits																			
Necessary and recommended prerequisites of the module	GEO 431 General and Historical Geology																			
Module objectives/expected learning outcomes	<p>The purpose of the course: is to familiarize students with the topography of the Earth in relation to its morphology, genesis, age and development, as well as understanding the relationship between the modern and buried topography with loose deposits, knowledge of the features of the Quaternary deposits, their genetic and stratigraphic classifications, methods of study and mapping.</p> <p>Course Objective:</p> <ul style="list-style-type: none"> - gaining knowledge on the classification of relief and the role of relief-forming factors in its origin; - the assimilation of techniques and methods for a comprehensive study of the terrain, the identification of geomorphological complexes, their relationships among themselves, the geological structure and loose deposits; - familiarization with the main features of geomorphology and geology of the Quaternary sediments of Kazakhstan; - the acquisition of techniques and methods for compiling geomorphological maps and maps of Quaternary sediments, their analysis with a forecast of further development of the relief and localization of minerals. 																			
Content	<p>Geomorphology is a science that studies the shape of the earth's surface (topography) in relation to their general appearance, size, origin (genesis) and age. The formation of the relief is due to many variables: conditions, factors and processes that develop in time and space. The most pronounced relief formation manifested itself in Neogene-Quaternary time, the so-called neotectonic stage of the Earth's development, which is studied by the geology of anthropogenous. The close connection and interdependence of relief forms, continental deposits and the conditions in which they are formed, determines the need to consider these issues simultaneously in one course. Knowledge of the laws and features of the formation of the relief makes it possible to carry out a forecast and search for minerals.</p>																			
Examination forms	<p>Each control work except tests is evaluated according to 4 criteria:</p> <ul style="list-style-type: none"> - accuracy and accuracy – 30% (how accurately and accurately the work is calculated); - creativity and creativity – 30% (how and how the work is presented); - completeness and maturity – 40% (how deeply, logically and structurally the work is solved); - originality – a special coefficient of 1.0, 0.5 or 0 is used. <p>The exam is in writing (a ticket of 3 questions), there is a zero ticket in the form of a guide for passing the exam on the website, login under the student's username.</p>																			
Study and examination requirements	<table border="1"> <thead> <tr> <th colspan="2">Maximum marks by the tasks types</th> </tr> </thead> <tbody> <tr> <td>Activity at the lecture</td> <td>10 IWUI 0.6 points = 6</td> </tr> <tr> <td>Laboratory work</td> <td>8 works 5 points = 40</td> </tr> <tr> <td>Completion of tasks (IWST)</td> <td>2 IWS 2 points=4</td> </tr> <tr> <td>1st intermediate certification (Midterm)</td> <td>M-1: 3 points=3</td> </tr> <tr> <td>Completion of tasks (IWS)</td> <td>2 IWS 2 points=4</td> </tr> <tr> <td>2nd final certification (Endterm)</td> <td>M-2: 3 points=3</td> </tr> <tr> <td>Final exam</td> <td>40</td> </tr> <tr> <td>Total</td> <td>100</td> </tr> </tbody> </table>		Maximum marks by the tasks types		Activity at the lecture	10 IWUI 0.6 points = 6	Laboratory work	8 works 5 points = 40	Completion of tasks (IWST)	2 IWS 2 points=4	1st intermediate certification (Midterm)	M-1: 3 points=3	Completion of tasks (IWS)	2 IWS 2 points=4	2nd final certification (Endterm)	M-2: 3 points=3	Final exam	40	Total	100
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		manual / compiled. T. V. Kezina. - Blagoveshchensk: Amur. meme. University.publishing house, 2012. -69 P.
	Geomorphology: study for students A. N. Lastochkin, A. N. Lastochkin, A. N. Lastochkin, etc. and the editorial office of D. V. Lopatina. M.: "Academy" Publishing center, 2005. 528 P.	Geomorphology and quaternary geology. Topic: exogenous processes of land relief formation on the territory of the Amur region. Moves [text] : manual / comp. In The Course Of The Study, Students Were Given The Opportunity To Study At The University. - Blagoveshchensk: [B. I.], 2012. - 58 p.
	Ruchagov G. I. general geomorphology. M.: Moscow Univer. Print. Science, 2006. 416 P.	Geomorphology and quaternary geology. Topic: exogenous processes of land relief formation on the territory of the Amur region. Naledi [electronic resource]: manual / Amgu, IFF ; comp. T. V. Kezina. - Blagoveshchensk: [B. I.], 2012. - 41 p.
		Topography of Kazakhstan (1: 1 500 000 explanatory note to the geomorphological map of Kazakhstan of the large-scale USSR). Part 2. - Alma-Ata: Science, 1991.

Description of the discipline module

Module designation	GEO462 Oil and gas regions of Kazakhstan
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Tolganay Jarassova
Language	English
Relation to curriculum	<i>Compulsory</i>
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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	Availability of the Teams platform
Module objectives / intended learning outcomes	2Purpose and objective of the course The purpose of the course: Generalization and analysis of comprehensive geological and field information about fields and deposits of oil and gas in the initial state and in the process of development for the geological and technical justification of the most effective development systems and maximum extraction of oil and gas from the bowels.
Content	In the discipline oil and gas provinces of the world, the tasks of oil and gas geological zoning are solved. Kazakhstan has a share in four oil & gas provinces: Pre-Caspian Basin, Mangistau-Usturt Basin, Central Kazakhstan Basin and Western Siberian Basin. Exploration in those provinces in which oil and gas has already been extracted had, led to the discovery of more than 200 oil, gas, oil-and-gas and condensate hydrocarbon accumulations. Of these, the Kashagan, the Tengiz and the Karachaganak fields can be considered giants
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	1. Abilkhasimov H.B. Features of the formation of natural reservoirs of Paleozoic deposits of the Caspian basin and the assessment of the prospects of their oil and gas potential: monograph – M.: Publishing House of the Academy of Natural Sciences, 2016. – 244 p 2. Amanniyazov K.N., Akhmetov A.S., Kozhakhmet K.A. Oil and gas fields of Kazakhstan, Almaty, 2003, 400 p., ISBN: 9965-54-17-57-6 3. Bulekbayev Z.E., Votsalevsky E.S., Iskuzhiev B.A., Kamalov S.M., Korostyshevsky M.N., Kuandykov B.M., Kuantaev N.E., Marchenko O.N., Matloshinsky N.G., Nazhmetdinov A.Sh., Filipyev G.P., Shabatin I.V., Shahabaev R.S., Shudabaev K.S. Oil and gas fields of Kazakhstan. Directory, Almaty, 1996

Description of the discipline module

Module designation	PET 405 "Reservoir engineering. Primary recovery "
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Rizakhan Uzbekgaliyev
Language	English
Relation to curriculum	<i>Compulsory</i>
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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	Availability of the Teams platform
Module objectives / intended learning outcomes	Purpose: to be able to determine the paleogeographic conditions for the formation of sedimentary rocks; to characterize sedimentary formations, to distinguish lithological (granulometric), genetic and facies types of sediments, as well as lithogenetic types of rocks; to determine the mineral composition of sediments and rocks, their structural, textural and other structural features. Task: - to study the composition and structure of sedimentary rocks; - to study the patterns of sediment distribution in the earth's crust; - to master the technique of restoring the conditions of accumulation and the environment of sedimentation. - study of the lithological composition of reservoir rocks of various types, the features of their formation, in the light of the theory of organic origin and the doctrine of the stages of oil and gas formation.
Content	The course is intended for students of the educational program "Geology and exploration of mineral deposits". This course covers calculations of the material balance for natural gas, retrograde condensate, non-volatile (black oil) and volatile (volatile oil) oil systems with and without a gas cap, water pressure regime. Students will also learn analytical methods for predicting reservoir productivity using material balance and analysis of the production drop curve.
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	1. Z. V. Sterlenko, K. V. Umanzhinova. Lithology. Stavropol. 2016. 2. V.P.Morozov. LITHOLOGY: THEORY OF SEDIMENTOGENESIS AND LITHOGENESIS 3. A.V. Yezhova. Lithology. Tomsk; TPI, 2014.

Description of the discipline module

Module designation	GEO 442 "Lithology, diagenesis and biofacies of oil and gas complexes"
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Semester(s) in which the module is taught	5th semester
Person responsible for the module	Rizakhan Uzbekgaliyev
Language	English
Relation to curriculum	<i>Compulsory</i>
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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	Availability of the Teams platform
Module objectives / intended learning outcomes	Purpose: to be able to determine the paleogeographic conditions for the formation of sedimentary rocks; to characterize sedimentary formations, to distinguish lithological (granulometric), genetic and facies types of sediments, as well as lithogenetic types of rocks; to determine the mineral composition of sediments and rocks, their structural, textural and other structural features. Task: - to study the composition and structure of sedimentary rocks; - to study the patterns of sediment distribution in the earth's crust; - to master the technique of restoring the conditions of accumulation and the environment of sedimentation. - study of the lithological composition of reservoir rocks of various types, the features of their formation, in the light of the theory of organic origin and the doctrine of the stages of oil and gas formation.
Content	The course is intended for students of the educational program "Geology and exploration of mineral deposits". Lithology is the science of modern sediments and sedimentary rocks. Its name comes from the Greek words: "litos" – stone, "logos" – learning. Lithology is closely related to other sciences of the geological cycle – stratigraphy, paleontology, petrography, crystallography, mineralogy, historical geology, the doctrine of oil, geochemistry, etc. In recent years, the science of Sedimentology has been separated from lithology and rapidly developed, studying the conditions of modern sedimentation in a wide variety of physical and geographical conditions.
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	1. Z. V. Sterlenko, K. V. Umanzhinova. Lithology. Stavropol. 2016. 2. V.P.Morozov. LITHOLOGY: THEORY OF SEDIMENTOGENESIS AND LITHOGENESIS 3. A.V. Yezhova. Lithology. Tomsk; TPI, 2014. 4. mk:@MSITStore:D:\ashpektorov\Desktop\

Description of the discipline module

Module designation	GEO 446 "Geodynamics of lithospheric plates"
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Rizakhan Uzbekgaliyev
Language	English

Relation to curriculum	<i>Compulsory</i>
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	Purpose: formation of a student's holistic understanding of the geology, the structure of the earth's crust, its structural elements, geological processes occurring in the zones of spreading, subduction and collision of lithospheric plates forming oil and gas basins. Task: must have the skills to analyze and summarize the data of modern publications and discoveries, independently read the tectonic map and explain the processes occurring in the zones of spreading, subduction and collision of lithospheric plates; must have the skills to conduct paleotectonic studies based on geological sections and structural maps.
Content	The course is intended for students of the educational program "B071 Mining and mining" Geotectonics is a branch of geology that became an independent scientific discipline in the 30s of the XX century. Before that, it formed the chapter of general geology and was simply called tectonics. In the sense of the two Greek words that make up its name, this is the science of the structure of the Earth. A more complete formulation of the subject of geotectonics defines it as the science of the structure, movements and deformations of the lithosphere and its development in connection with the development of the Earth as a whole. The lithosphere includes the earth's crust and the uppermost, most elastic part of the mantle. Its structure (structure) implies an uneven distribution of rocks of different composition, origin and conditions of occurrence.
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	1. Lomize M.G., Hain V.E. "Geotectonics with the basics of geodynamics". M. 2005. 2. Lobkovsky L. I., Nikishin A.M., Hain V. E. Modern problems of geotectonics and geodynamics. – M.: Scientific World, 2004. – 610 p. 3. Nikishin A.M. Global geodynamics. Moscow 2014.

Description of the discipline module

Module designation	GPH182" Modern geophysical technologies in the calculating of reserves of uranium deposits"
Semester(s) in which the module is taught	7th semester
Person responsible for the module	
Language	English
Relation to curriculum	<i>Compulsory</i>

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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	Availability of the Teams platform
Module objectives / intended learning outcomes	The course studies GIS methods in the exploration and development of uranium deposits, the methodology for assessing the radioactive equilibrium in uranium ores, the principles of delineation of ore deposits, the methodology for determining the boundaries and capacity of ore bodies, the specifics of calculating the reserves of uranium deposits. The basics of interpretation of GIS diagrams, assessment of filtration properties of rocks are considered.
Content	With the growing demand for uranium, how as a raw material for the civilian nuclear industry, the uranium mining industry is growing and expanding all over the world. To date, Kazakhstan has uranium reserves of about 1.7 million tons. About 80% of them are concentrated in deposits of the formation-infiltration type, in water-saturated permeable rocks. The aim is to increase the geological efficiency of geophysical work on infiltration-type uranium deposits by improving the methodology for calculating geological and geotechnological parameters of ore-bearing rocks for calculating uranium reserves according to GIS data (based on induction logging data).
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	1. Lomize M.G., Hain V.E. "Geotectonics with the basics of geodynamics". M. 2005. 2. Lobkovsky L. I., Nikishin A.M., Hain V. E. Modern problems of geotectonics and geodynamics. – M.: Scientific World, 2004. – 610 p. 3. Nikishin A.M. Global geodynamics. Moscow 2014. 4. Nikishin A.M. Types of sedimentary basins. Presentations

Description of the discipline module

Module designation	GEO447 " Oil and gas provinces of the world"
Semester(s) in which the module is taught	8th semester
Person responsible for the module	Smabaeva Raigul Kulbekovna, Sanatbekov Miras
Language	English
Relation to curriculum	<i>Compulsory</i>
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 <i>ECTS</i>

Required and recommended prerequisites for joining the module	Availability of the Teams platform
Module objectives / intended learning outcomes	<p>Purpose: to study the main features and features of the tectonic structure of the countries of the world</p> <p>knowledge of the main structural elements of oil and gas zones. Oil and gas ability to determine the stratigraphic age of layers, productive lithological groups for example:</p> <p>Task: - knowledge of the principles of zoning of oil and gas zones;</p> <p>- Analysis of oil and gas zones, structural maps, stratigraphic creating cross-sections;</p> <p>- Master the use of studying the laws of the location of oil and gas ores of the world.</p>
Content	<p>Discipline " oil and gas province of the countries of the world " 5b070600-Geology and utility</p> <p>Bachelor's degree in exploration of mineral deposits, oil geologists it is among the most important subjects in preparation.</p> <p>Within the framework of the course, students will be able to study the problems of oil and gas industry in the oil and gas regions of the world. their features, differences from each other, geological structure, full knowledge of tectonic features.</p> <p>Students analyzed geological maps and determined their features, must fully master the methods of capturing sections</p>
Examination forms	Multivariate test
Study and examination requirements	<p>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:</p> <p>- delivery of tasks on time. There are penalties of -10% for late delivery;</p> <p>- 20% non-participation in the audience (for a good reason with supporting documents) - rating "F (Fail)";</p> <p>- plagiarism and cheating during the execution of the task are not allowed;</p> <p>- mandatory use of electronic gadgets in the classroom, which is welcome, but it is unacceptable to use them in the exam.</p>
Reading list	<ol style="list-style-type: none"> 1. Fersman A.E., The journey behind the stone., Amphora, 2015. 384 p. 2. Koronovsky N.V. General geology. (2003) 3. K.E. Zakrevsky, N.V. Nasonova Geological modeling of Neocomian clinofolds Siberia Year of publication: 2012 4. Sokolovsky A.K. (ed.) General geology. (2006) 5. К.А. Антипова, О.А. Кулакова. История нефтегазовой отрасли, Учебное пособие, Самарский государственный технический университет 2020 6. Ларионов А.К. Занимательная инженерная геология М.: Книга по требованию 2012. – 282 с

Description of the discipline module

Module designation	GEO 456 "Theoretical foundations of prospecting and exploration of oil and gas fields"
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Smabaeva Raigul Kulbekovna, Sanatbekov Miras
Language	English
Relation to curriculum	<i>Compulsory</i>
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	<p>Purpose: to study the main features and features of the tectonic structure of the countries of the world</p> <p>knowledge of the main structural elements of oil and gas zones. Oil and gas ability to determine the stratigraphic age of layers, productive lithological groups for example:</p> <p>Task: - knowledge of the principles of zoning of oil and gas zones;</p> <ul style="list-style-type: none"> - Analysis of oil and gas zones, structural maps, stratigraphic creating cross-sections; - Master the use of studying the laws of the location of oil and gas ores of the world.
Content	<p>Discipline " oil and gas province of the countries of the world " 5b070600-Geology and utility</p> <p>Bachelor's degree in exploration of mineral deposits, oil geologists it is among the most important subjects in preparation.</p> <p>Within the framework of the course, students will be able to study the problems of oil and gas industry in the oil and gas regions of the world. their features, differences from each other, geological structure, full knowledge of tectonic features.</p> <p>Students analyzed geological maps and determined their features, must fully master the methods of capturing sections</p>
Examination forms	Multivariate test
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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	<ol style="list-style-type: none"> 1. Fersman A.E., The journey behind the stone., Amphora, 2015. 384 p. 2. Koronovsky N.V. General geology. (2003) 3. K.E. Zakrevsky, N.V. Nasonova Geological modeling of Neocomian clinofolds Siberia Year of publication: 2012 4. Sokolovsky A.K. (ed.) General geology. (2006)

Description of the discipline module

Module designation	GEO 481 " Geodynamics of oil and gas pools"
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Rizakhan Uzbekgaliyev, Omirzakova Elmira Zhenisovna
Language	English
Relation to curriculum	<i>Compulsory</i>
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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	Availability of the Teams platform

Module objectives / intended learning outcomes	Objective: During the course, the student will master the practical use of fundamental theoretical concepts about the patterns of formation of multi-scale tectonic structures in the Earth's lithosphere, methods of mapping them, purposes and methods of their modeling and their role in the distribution of hydrocarbon accumulations. Task: As a result of mastering the discipline, the student must know how to solve standard problems in the field of geotectonics and geodynamics of oil and gas bearing areas and the use of various methods of structural and tectonic prediction of oil and gas.
Content	The course is intended for students of the educational program "B071 Mining and mining" In the theory of plate tectonics, the key position is occupied by the concept of geodynamic situation - a characteristic geological structure with a certain ratio of plates. The same type of tectonic, magmatic, seismic and geochemical processes occur in the same geodynamic environment. Lithospheric plate tectonics is a modern geological theory about the movement of the lithosphere, according to which the earth's crust consists of relatively integral blocks – plates that are in constant motion relative to each other. At the same time, in the expansion zones (mid-oceanic ridges and continental rifts), as a result of spreading (English seafloor spreading – spreading of the seabed), a new oceanic crust is formed, and the old one is absorbed in the subduction zones.
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	1. Maslov A.V. et al. "Sedimentary formations and sedimentary basins". Textbook, Ekaterinburg, 2002. 2. Lobkovsky L. I., Nikishin A.M., Khain V. E. Modern problems of geotectonics and geodynamics. – M.: Scientific world, 2004. – 610 p. 3. Nikishin A.M. Global geodynamics. Moscow 2014. 4. Nikishin A.M. Types of sedimentary basins. Presentations.

Description of the discipline module

Module designation	GEO448 " Physics of Oil Reservoir "
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Tanirbergenov Amanzhol Gizzatovich, Omirzakova Elmira Zhenisovna
Language	English
Relation to curriculum	<i>Compulsory</i>
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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	Availability of the Teams platform

Module objectives / intended learning outcomes	<p>Purpose: The discipline "Oil reservoir Physics" aims to give an idea and knowledge about the physical properties of oil and gas reservoir rocks; physical, mechanical and thermal properties of rocks; hydrocarbon content of reservoirs; oil and gas their composition and physical properties; phase states of hydrocarbon systems; modeling of reservoir processes</p> <p>Task: The objectives of the discipline are as follows: the development of knowledge that provides a holistic perception of the world picture; the development of independent creative mastery of new knowledge; the development of fundamental courses of related sciences that guarantee them new progressive solutions.</p>
Content	<p>The course is intended for students of the specialty 5B070600 – geology and exploration of mineral deposits. The task of the discipline is to study the reservoir properties of rocks. Types of reservoir rocks. Porosity. Types of porosity. Permeability of rocks. Darcy's law. Radial filtration of oil and gas in a porous medium. Assessment of the permeability of a formation consisting of several layers of different permeability. Classification of permeable rocks. The dependence of permeability on porosity. Types of permeability. Mechanical and thermal properties of rocks. Composition and physico-chemical properties of natural gases. Characteristics of a mixture of ideal gases. Equations of state. Solubility of gases in oil and water. Physico-chemical properties of reservoir waters. Some properties and composition of reservoir water. The composition of oil. Fractional composition of oil. Physico-chemical properties of oil. Phase transitions in oil, water and gas.</p>
Examination forms	Multivariate test
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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	<ol style="list-style-type: none"> 1. Maslov A.V. et al. "Sedimentary formations and sedimentary basins". Textbook, Ekaterinburg, 2002. 2. Lobkovsky L. I., Nikishin A.M., Khain V. E. Modern problems of geotectonics and geodynamics. – M.: Scientific world, 2004. – 610 p. 3. Nikishin A.M. Global geodynamics. Moscow 2014.

Description of the discipline module

Module designation	GEO 450 "Geologic basics of oil and gas field development"
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Rizakhan Uzbekgaliyev , Urmanova Dilyara Eldarovna
Language	English
Relation to curriculum	<i>Compulsory</i>
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	<p>Purpose: the main purpose of studying the discipline is to study the field-geological support and control of the development of oil and gas fields (geological justification and selection of development systems, control of oil, gas and water production, control of reservoir pressure and temperature, regulation of the development process).</p> <p>Task: as a result of mastering the discipline, the student must master the theoretical and practical basics of preparing deposits for development, methods of geological and field control over the process of developing hydrocarbon deposits; must demonstrate the ability and readiness to monitor and improve oil and gas field development systems at a modern level.</p>
Content	<p>The course is intended for students of the educational program "B071 Mining and mining"</p> <p>Oil has been known for a long time. The word "oil" comes from the word "oil", which means "to leak" in the language of one of the peoples of Asia Minor. The release of natural combustible gas received the name of "eternal fires" from ancient peoples. They study:</p> <ul style="list-style-type: none"> - on systems for the development of oil and gas fields under natural conditions and artificial influence; - about the main technological solutions in the development of oil and gas fields with flooding and their geological justification; - on the control of oil, gas and associated water production; - about the control of reservoir pressure and temperature; - on monitoring the coverage of the operational facility by the displacement process; - on the control of the introduction of injected water into productive formations; - on the regulation of the development of oil fields in different geological conditions.
Examination forms	Multivariate test
Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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	<ol style="list-style-type: none"> 1. Pulkina N.E. et al. Geological foundations of the development of oil and gas fields. Tomsk, 2011. 2. Muslimov, Renat Khaliullovi. Methods of forecasting, prospecting and exploration of oil and gas fields. Textbook / R.H.Muslimov, V.V.Ananyev, V.M.Smelkov, R.K.Tukhvatullin. - Kazan: Publishing house of Kazan. State. Un-ta, 2007. - 320s. 2007., 3. Grebnev V.D. et al. Fundamentals of oil and gas business. Study guide. Perm 2013.

Description of the discipline module

Module designation	GEO 449 "Oil and gas field geology and reserves calculation"
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Rizakhan Uzbekgaliyev
Language	English
Relation to curriculum	<i>Compulsory</i>
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	Objective: to study the origin, conditions of occurrence of combustible minerals in the earth's interior, accumulation and migration of hydrocarbons, formation of deposits, patterns of spatial distribution of oil and gas and methods of calculating oil and gas reserves." Task: detailed study of oil and gas fields and deposits in the initial (natural) state and in the process of development and rational use of the subsoil.
Content	The course is intended for students of the educational program "B071 Mining and mining" Oil has been known for a long time. The word "oil" comes from the word "oil", which means "to leak" in the language of one of the peoples of Asia Minor. The release of natural combustible gas received the name of "eternal fires" from ancient peoples. They study: -genesis of oil and gas; conditions of oil and gas in the earth's crust; - types of natural reservoirs, traps and oil and gas deposits; - processes of formation and destruction of oil and gas accumulations; - criteria and objects for forecasting and searching for hydrocarbon accumulations; -stages and stages of the exploration process; - Methods of calculating oil and gas reserves.
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	1. Zhdanov M.A. Oilfield geology and calculation of oil and gas reserves. Moscow 2005. 2. Abrikosov I.H. General, oil and oilfield geology. Moscow. 2006.1. 3. Ashirov K. B. Oilfield geology and hydrogeology. Moscow, 1999.

Description of the discipline module

Module designation	GEO 459 " Geochemistry of organic matter and hydrocarbons of oil and gas basins"
Semester(s) in which the module is taught	8th semester
Person responsible for the module	Jarasova Tolganai Sovetkanovna
Language	English
Relation to curriculum	<i>Compulsory</i>
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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	Availability of the Teams platform

Module objectives / intended learning outcomes	The purpose of the course is to master the basics of the theory of the formation of oil and gas deposits; the factors controlling their composition and placement, as well as the applied use of geochemical knowledge in the search, exploration, development of deposits, collection and preparation, transportation and processing of oil Course objective: to study the transformation of the composition, concentrations and patterns of distribution of organic matter (s) starting from the initial biochemical compounds of living matter, their transformation into fossil S and its further transformation at various stages lithogenesis (sedimentogenesis, diagenesis, catagenesis, hypergenesis).
Content	Considers aspects of the development of the doctrine of the formation of the composition of fuels fossils and methods of their study. The process of oil and gas formation. The natural bodies where the processes of oil and gas generation take place (or have taken place) are the oil and gas mother formations, each stage of whose life corresponds to a certain composition of S and products of its transformation (oil, gas). The composition, concentration and degree of transformation of hydrocarbons are the basis for quantitative and qualitative assessment of geological hydrocarbon resources by methods of organic geochemistry and mathematical modeling. They study <ul style="list-style-type: none"> - the main classical and modern hypotheses of the origin of oil; - the structure of the main oil and gas complexes and their elements; - composition, properties of oils and their relationship with the quality and price of oil; - methods for assessing the maturity and generation potential of rocks; - the main geochemical methods of searching for oil and gas deposits, their tasks and content at the regional and exploratory stage; - types and forms of oil and gas migration in rocks, the driving forces of migration; - the concept of caustobilites and their genetic classification; - the processes of transformation of oil in deposits.
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: <ul style="list-style-type: none"> - 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	1. Bogorodskaya L.I., Kantorovich A.E., Larichev A.And.. Kerogen. 2005 Methods of study,geochemical interpretation. Novosibirsk PUBLISHING HOUSE SB RAS BRANCH "GEO", 256 p. 2. Fundamentals of oil and gas geology, Chernova O.S., 2008. Study guide 3. Bazhenova O.K., Burlin Yu.K., Sokolov B.A., Khain V.E. Geology and geochemistry of oil and gas. Moscow State University Publishing House, Moscow, 2000, 384 pages, UDC: 553.9 (071.1), ISBN: 5-211-04888-1 4. Peters, K.E., Walters, C.C. and Moldowan, J.M. 2005. The Biomarker Guide, Vol.2: Biomarkers and Isotopes in Petroleum Exploration and Earth History, 2nd ed., Cambridge University Press, Cambridge, 1155p.

Description of the discipline module

Module designation	GEO 460 " Computer modeling of oil and gas fields"
Semester(s) in which the module is taught	8th semester
Person responsible for the module	Tanirbergenov Amanzhol Gizzatovich, Urmanova Dilyara Eldarovna
Language	English
Relation to curriculum	<i>Compulsory</i>
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 <i>ECTS</i>
Required and recommended prerequisites for joining the module	Availability of the Teams platform
Module objectives / intended learning outcomes	<p>The objectives of mastering the discipline are the formation of students: basic knowledge related to the application of methods for solving oil and gas problems; computer processing of experimental results, their meaningful interpretation and analysis; as well as possession of technical modeling tools for visual presentation of results using a PC.</p> <p>Task: The tasks of the discipline are to build a computer model that is based on abstraction from the specific nature of the object or phenomenon being studied. The more significant, important properties are identified and taken into account in a computer model, the more approximate it will be to the real model. Computer modeling consists in conducting a series of computational experiments on a computer, the purpose of which is to analyze, interpret and compare the simulation results with the real behavior of the object under study and, if necessary, further refine the model.</p>
Content	<p>The course is intended for students of specialty 6B07202 – geology and exploration of mineral deposits. The objective of the discipline is to study mathematical methods of modeling oil and gas fields. Construction of a difference analogue of differential equations, stable numerical methods for solving a system of difference equations and proof of convergence of the obtained solution methods.</p> <p>They study</p> <ul style="list-style-type: none"> <input type="checkbox"/> make mathematical models of problems; <input type="checkbox"/> analyze numerical solutions of these problems; <input type="checkbox"/> discuss, test and compare the results of a model problem with full-scale results; <input type="checkbox"/> prove the adequacy of the model;.
Examination forms	Multivariate test

Study and examination requirements	<p>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:</p> <ul style="list-style-type: none"> - 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	<ol style="list-style-type: none"> 1. Shchelkachev V.N., Lapuk B.B. Underground hydromechanics. Moscow: Nedra, 2001 2. Basniev K.S. , Kochina I.N. Maksimov V.M. Underground hydromechanics – M, Nedra 1986 3. Fundamentals of filtration theory, Leontiev N.E., 2009 4. M. V.M. The theory of filtration. Gubkin State Academy of Oil and Gas, Moscow, 1988 5. Vasilyeva M.V., Afanasyeva N.M., Zakharov P.E., Kolesov A.E. Parallel numerical modeling of filtration: Textbook. And Yakutsk: Publishing and printing complex of NEFU, 2011 <p>zdaafic complex of NEFU, 2011. - 86 p.</p>