

**Ministry of Science and Higher Education of the Republic of Kazakhstan  
Kazakh National Research Technical University  
named after K.I. Satpayev**

**MODULAR DIRECTORY**

**for an educational bachelor's program**  
**Operational and service engineering** (Bachelor's Degree) /  
**Technological Machines and Equipment** (Bachelor's Degree)

**Almaty, 2022**

**Operational and Service Engineering** (Bachelor's Degree) /  
**Technological Machines and Equipment** (Bachelor's Degree)

Module designation	<b><i>Module of language training</i></b>
Name of disciplines included in this module	<i>10 credits – English language 10 credits – (this block consists of the following elective disciplines: Kazakh (Russian) language</i>
Semester(s) in which the module is taught	<i>Autumn, Spring (1,2)</i>
Person responsible for the module	<i>Turlybekova Anar Orymbaevna</i>
Language	<i>Kazakh, Russian, English</i>
Relation to curriculum	<i>Mandatory</i>
Teaching methods	<i>Practical exercises</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload: 600 hours Practical 180 IWS 420</i>
Credit points	<i>20</i>
Required and recommended prerequisites for joining the module	<i>Diagnostic Test</i>
Module objectives/intended learning outcomes	<p><i>The purpose of the module is to consolidate languages at the professional level of the specialty.</i></p> <p><i>The module develops 4 skills of teaching a foreign language: reading, listening, writing and speaking, introduces basic knowledge and the use of grammar and vocabulary, special emphasis is placed on independent study and critical thinking.</i></p> <p><i>Specific tasks of the module:</i></p> <ol style="list-style-type: none"> <li><i>1. The ability to draw conclusions about the main ideas and auxiliary details of various written and oral texts of the CEFR A2 level.</i></li> <li><i>2. The ability to conduct a conversation using appropriate grammatical structures and an active vocabulary (Glossary, lexical minimum -400 words, including technical terminology).</i></li> <li><i>3. Writing various types of text in the form of a logical and structured paragraph in the volume of 130-150 words.</i></li> <li><i>4. Knowledge of a number of grammatical structures with minor inconsistencies.</i></li> </ol> <p><i>The module allows students to practically master the basics of scientific style and develops the ability to perform structural and semantic analysis of the text.</i></p>
Content	<p><i>The description of the contents should clearly indicate focus areas and the level of difficulty.</i></p> <p><i>In this module, much attention is paid to completing tasks for simple texts and composing monologues and dialogues using the terminology of the specialty. The development of listening skills occurs to a greater extent through the performance of listening tasks during extracurricular hours and during online classes.</i></p> <p><i>The module also focuses on completing tasks using simple texts, as well as on creating short paragraphs, monologues and dialogues on various topics related to the specifics of the industry.</i></p>
Exams and assessment formats	<i>The module exams are conducted in the IELTS format. The examination ticket consists of 4 sections (Listening, Reading, Writing, Speaking), for each of which a certain amount of time and points are allocated at the discretion of the teacher, but the total time allocated to the student to provide an answer to the examination ticket should not exceed 120 minutes, and the maximum number of points is 40.</i>

Study and examination requirements	<p><i>Admission of students to the exam in the discipline is carried out automatically:</i></p> <ul style="list-style-type: none"> <li>- based on the assessment of the admission rating, determined by the results of the current and boundary control of academic performance (the total number of required semester points is at least 25 for two attestations);</li> <li>- those who have no outstanding tuition fees;</li> <li>- those who do not have more than 20% of skipping training sessions in the discipline;</li> <li>- not being on academic leave or academic break;</li> </ul> <p><i>those who do not have an overdue medical examination.</i></p> <p><i>The final assessment of the discipline includes assessments of current academic performance and final control. The assessment of the current academic performance (admission rating) is 60% of the final assessment of knowledge in the discipline, the assessment of the exam is 40% of the final assessment of knowledge in this discipline. Thus, the final score for each discipline is determined as the sum of the points scored by the student according to the results of the current and boundary performance controls (rating - a maximum of 60 points, a minimum of 25 points) and the exam (final control - a maximum of 40 points, a minimum of 20 points), which together makes a maximum of 100 points.</i></p>
Reading list	<p>1) <i>Essential Grammar in Use. Murphy R. - Cambridge University Press: 2002</i></p> <p>2) <i>Understanding and Using English Grammar, third edition. Betty Schrumpfer Azar – Longman: 1999</i></p> <p>3) <i>Everyday Technical English. – Longman, 2003</i></p> <p>4) <i>Engineering Workshop. – Oxford University Press, 2004</i></p> <p>5) <i>Afanasyeva R. M. English. Development of oral speech skills based on thematic texts. Part I.: educational and methodological manual. - Moscow: Moscow State University of the Government of Moscow, 2012.</i></p> <p>6) <i>Krylova I. P. Collection of exercises on English grammar / A Grammar of Present-day English: Practice Book. - Moscow: KDU, 2007.</i></p> <p>7) <i>Antonia Clare, J.J. Wilson. Total English Intermediate Students' Book. Longman. 2006</i></p> <p>8) <i>Abduova B. S., Asanova U. O. Kazak tili: Orys tildi toptarga arnalgan oku kuraly.- Astana, 2017. -282 b.</i></p> <p>9) <i>Balabekov A. K., Bozbayeva-Hung A. T., Dosmambetova G. K., Salikhova B. O., Khazimova A. Zh.. Kazakh tili: ortadan zhogary degeige arnalgan okulyk. Ultyk testileu ortalygy. - Astana: 2017</i></p> <p>10) <i>Bozbayeva-Hung A. T., Balabekov A. K., Dosmambetova G. K., Salikhova B. O., Khazimova A. Zh. Kazak tili: orta degeige arnalgan okulyk. Ultyk testileu ortalygy. - Astana: 2017.</i></p> <p>11) <i>Anikina M. N. We are starting to learn Russian. Stairs: Textbook-book. - Moscow: Rus. yaz., 2002</i></p>

Module designation	<b><i>Module of information technology</i></b>
Name of disciplines included in this module	<i>5 credits – Information &amp; Communication Technologies</i>
Semester(s) in which the module is taught	<i>Spring (4)</i>
Person responsible for the module	<i>Moldagulova Ayman Nikolaevna</i>
Language	<i>English</i>
Relation to curriculum	<i>Mandatory</i>
Teaching methods	<i>Lecture, laboratory work.</i>
Workload (incl. contact hours, self-study hours)	<p><i>Total workload:</i></p> <p><i>150 hours</i></p> <p><i>Lectures 30</i></p> <p><i>Laboratory 15</i></p> <p><i>IWS 105</i></p>

Credit points	5
Required and recommended prerequisites for joining the module	<i>Diagnostic Test, Mathematics I.</i>
Module objectives/intended learning outcomes	<p><i>The course «Information and communication technologies» as component of the compulsory general educational courses is designed to form and strengthen the digital skills and competencies of students in the increasingly globalized and digital world. The content of this course corresponds to the DIGComp 2.0 Conceptual Reference Model in the European Framework of Digital Competency for Citizens. According to this model the digital competency represents the ability of application of the digital skills in various activities confidently. Critically meaningfully. Responsibly and provides lifelong learning.</i></p> <p><i>The key question is: What learning outcomes should students achieve in the module? For example. from the point of view of:</i></p> <ul style="list-style-type: none"> <li><i>- Knowledge: familiarity with information, theory and/or subject knowledge</i></li> <li><i>Skills: cognitive and practical abilities, for the development of which knowledge is used.</i></li> <li><i>- Competencies: integration of knowledge, skills, social and methodological abilities in work or training situations2.</i></li> </ul> <p><i>For example: "Students know that / can / can..."</i></p>
Content	<p><i>The description of the content should clearly indicate the main directions and the level of complexity.</i></p> <p><i>Information and communication technologies (ICT) is regarded as modern methods and means of communication of people in a normal and professional activities with the help of information technologies for the search, collection, storage, processing and dissemination of information.</i></p> <p><i>The discipline of "ICT" serves for formation at students of a certain outlook in the information sphere and the modern information culture, i.e. ability purposefully to work with information, professionally using for receiving, processing, transmission and its storage.</i></p> <p><i>This course is a top level exposure to computer hardware, software and communication systems. Students learn the functionality of hardware, software and network components as well as suggested best practices in maintenance and safety issues. Through hands-on activities and labs, students learn how to assemble and configure a computer as well as install operating systems and diagnostic application utilities. In addition, an introduction to networking is included. Students should be proficient in daily computer use (such as downloading and installing software from the Internet) and should be familiar with computer terms.</i></p>
Exams and assessment formats	<p><i>Two written/oral intermediate tests (30 minutes each) and one final oral exam (40 minutes), short computer quizzes, written homework</i></p> <p><i>The module exams are conducted in the form of a test. The test consists of 40 questions, but the total time allocated to the student to provide an answer to the test should not exceed 120 minutes, and the maximum number of points is 40.</i></p>

Study and examination requirements	<p><i>Requirements for successful completion of the module</i></p> <p><i>for example, the final assessment of the module consists of 60% of the performance in exams, 10% of quizzes, 10% of homework, 10% of class participation. To pass the exam, students must have a final grade of 60% or higher.</i></p> <p><i>Admission of students to the exam in the discipline is carried out automatically:</i></p> <ul style="list-style-type: none"> <li>- <i>based on the assessment of the admission rating, determined by the results of the current and boundary control of academic performance (the total number of required semester points is at least 25 for two attestations);</i></li> <li>- <i>those who have no outstanding tuition fees;</i></li> <li>- <i>those who do not have more than 20% of skipping classes in the discipline;</i></li> <li>- <i>not being on academic leave or academic break;</i></li> </ul> <p><i>those who do not have an overdue medical examination.</i></p> <p><i>The final assessment of the discipline includes assessments of current academic performance and final control. The assessment of current academic performance (admission rating) is 60% of the final assessment of knowledge in the discipline, the assessment of the exam is 40% of the final assessment of knowledge in this discipline. Thus, the final score for each discipline is determined as the sum of the points scored by the student according to the results of the current and boundary performance controls (rating - maximum 60 points, minimum 25 points) and the exam (final control - maximum 40 points, minimum 20 points), which together makes up a maximum of 100 points.</i></p>
Reading list	<ol style="list-style-type: none"> <li>1. June J. Parsons and Dan Oja, <i>New Perspectives on Computer Concepts 2018: Comprehensive, 20th Edition</i>, Course Technology Press, 25 Thompson Pl., Boston, MA, COPYRIGHT © 2018.</li> <li>2. Hans J Schnoll, <i>E-Government: Information, Technology, and Transformation: Information, Technology, and Transformation, Political Science</i>, Routledge, 2015.</li> <li>3. Shynybekov D.A., Uskenbayeva R.K., Serbin V.V., Duzbayev N.T., Moldagulova A.N., Duisebekova K.S., Satybaldiyeva R.Z., Hasanova G.I., Urmashev B.A. <i>Information and communication technologies. Textbook: in 2 parts. Part 1, 1st ed.</i> - Almaty: IITU, 2017. - 588 p., ISBN 978-601-7911 -03-4 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan).</li> <li>4. Shynybekov D.A., Uskenbayeva R.K., Serbin V.V., Duzbayev N.T., Moldagulova A.N., Duisebekova K.S., Satybaldiyeva R.Z., Hasanova G.I., Urmashev B.A. <i>Information and communication technologies. Textbook: in 2 parts. Part 2, 1st ed.</i> - Almaty: IITU, 2017. - 622 p., ISBN 978-601-7911 -04-1 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan).</li> <li>5. Vijay K. Vaishnavi, Vijay K. Vaishnavi, William Kuechler, <i>Design Science Research Methods and Patterns: Innovating Information and Communication Technology</i>, CRC Press 2nd Edition 2015.</li> <li>6. Urmashev B.A. <i>Information and communication technology: Textbook / B.A. Urmashev.</i> - Almaty, 2016. - 410 pages, ISBN 978-601-7940 -02-7 (A textbook in English with the stamp of the Ministry of Education and Science of the Republic of Kazakhstan)</li> <li>7. Usha Rani Vyasulu Reddi. <i>Primer Series on ICTD for Youth. Primer 1: An Introduction to ICT for Development</i> A learning resource on ICT for development for institutions of higher education.</li> </ol>

Module designation	<b><i>Module of socio-cultural development</i></b>
Name of disciplines included in this module	<i>5 credits – Modern History of Kazakhstan</i> <i>5 credits – Philosophy</i> <i>3 credits – Socio-political knowledge module (sociology, politology)</i> <i>5 credits – Socio-political knowledge module (culturology, psychology)</i>
Semester(s) in which the module is taught	<i>Autumn, Spring (2,3,4)</i>
Person responsible for the module	<i>Anasova Kalamkas Temirkulovna</i>
Language	<i>Kazakh, Russian, English</i>
Relation to curriculum	<i>Mandatory</i>
Teaching methods	<i>Lectures and practical classes</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload:</i> <i>540 hours</i> <i>Lectures 75</i> <i>Practical 90</i> <i>IWS 375</i>
Credit points	<i>18</i>
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<p><i>The purpose of the module is to adapt students to changing social realities. He will be proficient in culture and logic of thinking, capable of critical generalization, analysis and perception of historical and socio-political information, uses the basic provisions and methods of social and humanitarian sciences in solving social and professional tasks, is able to analyze socially significant problems and processes. Knows how to use regulatory legal documents in their activities.</i></p> <p><i>The module helps to identify and analyze the connections, correlation between natural science, technical and philosophical fields of knowledge, their mutual determination, place and role in culture.</i></p> <p><i>The module helps to identify the main problems of modern science and technology, prospects for new discoveries, and outline ways out of the crisis of man-made civilization. The main goal is to study, with the help of a philosophical approach, the foundations and boundaries of science and technology, the laws of their development, prospects and strategies for future existence.</i></p> <p><i>The key question is: What learning outcomes should students achieve in the module? For example. from the point of view of:</i></p> <ul style="list-style-type: none"> <li><i>- Knowledge: familiarity with information, theory and/or subject knowledge</i></li> <li><i>Skills: cognitive and practical abilities, for the development of which knowledge is used.</i></li> <li><i>- Competencies: integration of knowledge, skills, social and methodological abilities in work or training situations<sup>2</sup>.</i></li> </ul> <p><i>For example: "Students know that / can / can..."</i></p>

Content	<p><i>The description of the content should clearly indicate the main directions and the level of complexity.</i></p> <p><i>To familiarize students with the history of the formation and development of science, technology, its conceptual basis; to present the foundations and structure of science, technology; to consider the features of the current stage of development of science and its prospects; to substantiate the principles and laws of categorical thinking in the field of science; to analyze the methods and procedures of scientific cognition; to present basic natural science theories within the boundaries of mega-; macro-; microcosm; determine the philosophical foundations and boundaries of technology; demonstrate the diversity of meanings of technology and ways of its implementation; to focus on the crisis dynamics of the development of science and technology, ways out of this situation. The proposed course also outlines the issues of the formation of technical sciences, the features of technical knowledge.</i></p> <p><i>The module also studies historical events, phenomena, facts, processes that took place on the territory of Kazakhstan from ancient times to the present day. The sections of the discipline include: introduction to the history of Kazakhstan; steppe empire of the Turks; early feudal states on the territory of Kazakhstan; Kazakhstan during the Mongol conquest (XIII century); medieval states in the XIV-XV centuries. The main stages of the formation of the Kazakh statehood are also considered: the era of the Kazakh Khanate of the XV-XVIII centuries. Kazakhstan as part of the Russian Empire; Kazakhstan during the period of civil confrontation and under the conditions of a totalitarian system; Kazakhstan during the Great Patriotic War; Kazakhstan during the period of independence and at the present stage.</i></p>
Exams and assessment formats	<p><i>Two written/oral intermediate tests (30 minutes each) and one final oral exam (40 minutes), short computer quizzes, written homework</i></p> <p><i>The module exams are conducted in writing. The examination ticket consists of 3 questions (calculations), for each of which, at the discretion of the teacher, a certain amount of time and points are allocated, however, the total time allocated to the student to provide an answer to the examination ticket should not exceed 120 minutes, and the maximum number of points is 40. And also the teacher adheres to the following evaluation criteria:</i></p> <ol style="list-style-type: none"> <li><i>1. Accuracy – 35%.</i></li> <li><i>2. Completeness of the solution of the problem – 35%.</i></li> <li><i>3. Creativity and originality – 30%.</i></li> </ol>
Study and examination requirements	<p><i>Requirements for successful completion of the module</i></p> <p><i>for example, the final assessment of the module consists of 60% of academic performance in exams, 10% of quizzes, 10% of homework, 10% of class participation. To pass the exam, students must have a final grade of 60% or higher.</i></p> <p><i>Admission of students to the exam in the discipline is carried out automatically:</i></p> <ul style="list-style-type: none"> <li><i>- based on the assessment of the admission rating, determined by the results of the current and boundary control of academic performance (the total number of required semester points is at least 25 for two attestations);</i></li> <li><i>- those who have no outstanding tuition fees;</i></li> <li><i>- those who do not have more than 20% of skipping classes in the discipline;</i></li> <li><i>- not being on academic leave or academic break;</i></li> <li><i>- those who do not have an overdue medical examination.</i></li> </ul> <p><i>The final assessment of the discipline includes assessments of current academic performance and final control. The assessment of current academic performance (admission rating) is 60% of the final assessment of knowledge in the discipline, the assessment of the exam is 40% of the final assessment of knowledge in this discipline. Thus, the final score for each discipline is determined as the sum of the points scored by the student according to the results of the current and boundary performance controls (rating - maximum 60 points, minimum 25 points) and the exam (final control - maximum 40 points, minimum 20 points), which together makes up a maximum of 100 points.</i></p>

Reading list	<p>1) Nuryshva G. zh. "philosophy" – Almaty: Pearl-Pearl, 2013.</p> <p>2) Nazarbayev N.A. "Mangilik.El. Years equal to centuries. An Epoch equal to centuries" – Astana: Business World Astana, 2014</p> <p>3) Johnston D."A Brief History of Philosophy: From Socrates to Derrida". –A&amp;C Black, 2006. – 211 p.</p> <p>4)Kenny A."New History of Western Philosophy". Volume 1-4. –Oxford University Press, 2006 - 2010.</p> <p>5) Ayagan B.G., Abzhanov H.M., Seliverstov S.V., Bekenova M.S. Modern history of Kazakhstan. – Almaty, 2010</p> <p>6) Pankovskaya G.I., Fomin V.V. History of Kazakhstan. Visual and graphic material to help students. – Ust-Kamenogorsk, 2011</p> <p>7) Pankovskaya G.I., Fomin V.V. History of Kazakhstan. Chronological guide. – Ust-Kamenogorsk, 2011</p> <p>8) The history of Kazakhstan from ancient times to the present day in 4(5) volumes – Almaty, 1996-2010</p> <p>9) Klyashtorny S.G., Sultanov T.I. States and peoples of the Eurasian steppes. Antiquity and the Middle Ages. – St. Petersburg, 2004</p> <p>10) N.A. Nazarbayev In the flow of history. Almaty, 2003.</p> <p>11) Nazarbayev N.A. Critical decade. Almaty, Atamura, 2003</p> <p>12) Bisembayev A.A. The main elements of political design in the Republic of Kazakhstan. Almaty, 2010.</p>
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Module designation	<b><i>Module of anti-corruption culture, ecology and life safety base</i></b>
Name of disciplines included in this module	<i>5 credits – (this block consists of the following elective disciplines: Fundamentals of anti-corruption culture; Fundamentals of Entrepreneurship and Leadership; Ecology and life safety</i>
Semester(s) in which the module is taught	<i>Autumn (3)</i>
Person responsible for the module	<i>Anasova Kalamkas Temirkulovna</i>
Language	<i>Kazakh, Russian</i>
Relation to curriculum	<i>Mandatory</i>
Teaching methods	<i>lecture, laboratory work, practical work, calculations.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload:</i> <i>150 hours</i> <i>Lectures 30</i> <i>Laboratory 15</i> <i>Practical 105</i> <i>IWS 450</i>
Credit points	<i>5</i>
Required and recommended prerequisites for joining the module	<i>Module of socio-cultural development</i>



<p>Module objectives/intended learning outcomes</p>	<p><i>Purpose: to give students the basics of entrepreneurship, leadership and anti-corruption culture, including the formation of skills in marketing, management, financial and operational activities in entrepreneurship, business modeling of startup projects.</i></p> <p><i>Tasks:</i></p> <ul style="list-style-type: none"> <li>- familiarization with the essence, types of entrepreneurship;</li> <li>- give methods for choosing a business idea and a startup;</li> <li>- familiarization with the concept, elements, types of business model;</li> <li>- business plan-ownership of a business planning tool;</li> <li>- the use of marketing activities in entrepreneurship;</li> <li>- development of a sales strategy, development of a sales funnel, application of sales techniques;</li> <li>- organization of financial resources in business activities;</li> <li>- personnel management in business activities;</li> <li>- organization of entrepreneurial operational activities;</li> <li>- knowledge of the basics of developing and making strategic decisions on the commodity, price, sales and communication policy of the organization;</li> <li>- knowledge of ways and methods of leadership development;</li> </ul> <p><i>familiarization with the regulatory and legal framework for combating corruption.</i></p> <p><i>Learning outcomes</i></p> <p><i>After completing the course, the student must:</i></p> <p><i>Be able to:</i></p> <ul style="list-style-type: none"> <li>- develop a business model;</li> <li>- work in a team;</li> <li>- apply sales strategies.</li> <li>- analyze the internal environment;</li> <li>- apply methods of building competitive strategies.</li> <li>- make a business plan.</li> </ul> <p><i>To know:</i></p> <ul style="list-style-type: none"> <li>- theoretical and practical foundations and principles of marketing, management, finance;</li> <li>- sales tools and methods;</li> <li>- the basics of creating an effective business system for solving strategic tasks and developing arguments;</li> <li>- tools for evaluating the effectiveness of strategic decisions;</li> <li>- fundamentals and theories of leadership;</li> <li>- fundamentals of anti-corruption legislation.</li> </ul> <p><i>The key question is: What learning outcomes should students achieve in the module?</i></p> <p><i>For example. from the point of view of:</i></p> <ul style="list-style-type: none"> <li>- Knowledge: familiarity with information, theory and/or subject knowledge</li> </ul> <p><i>Skills: cognitive and practical abilities, for the development of which knowledge is used.</i></p> <ul style="list-style-type: none"> <li>- Competencies: integration of knowledge, skills, social and methodological abilities in work or training situations<sup>2</sup>.</li> </ul> <p><i>For example: "Students know that / can / can..."</i></p>
<p>Content</p>	<p><i>The description of the content should clearly indicate the main directions and the level of complexity.</i></p> <p><i>The module covers the following sections: Psychology of entrepreneurial thinking, types and significance of entrepreneurship; Marketing in entrepreneurship; Business model in entrepreneurship; Basic resources in entrepreneurship; Financial model of entrepreneurship; Analysis of the economic efficiency of investments; Leadership in the team, leadership styles, the essence of the majority, factors influencing the majority; Leadership qualities of the head, modern leadership models, conflicts in the organization; Legal foundations of anti-corruption activities in Kazakhstan. Anti-corruption service at the university.</i></p>

Exams and assessment formats	<p>Two written/oral intermediate tests (30 minutes each) and one final oral exam (40 minutes), short computer quizzes, written homework</p> <p>The module exams are conducted in writing. The examination ticket consists of 3 questions (calculations), for each of which, at the discretion of the teacher, a certain amount of time and points are allocated, however, the total time allocated to the student to provide an answer to the examination ticket should not exceed 120 minutes, and the maximum number of points is 40. And also the teacher adheres to the following evaluation criteria:</p> <ol style="list-style-type: none"> <li>1. Accuracy – 35%.</li> <li>2. Completeness of the solution of the problem – 35%.</li> <li>3. Creativity and originality – 30%.</li> </ol>
Study and examination requirements	<p>Requirements for successful completion of the module for example, the final assessment of the module consists of 60% of the performance in exams, 10% of quizzes, 10% of homework, 10% of class participation. To pass the exam, students must have a final grade of 60% or higher.</p> <p>Admission of students to the exam in the discipline is carried out automatically:</p> <ul style="list-style-type: none"> <li>- based on the assessment of the admission rating, determined by the results of the current and boundary control of academic performance (the total number of required semester points is at least 25 for two attestations);</li> <li>- those who have no outstanding tuition fees;</li> <li>- those who do not have more than 20% of skipping classes in the discipline;</li> <li>- not being on academic leave or academic break;</li> </ul> <p>those who do not have an overdue medical examination.</p> <p>The final assessment of the discipline includes assessments of current academic performance and final control. The assessment of current academic performance (admission rating) is 60% of the final assessment of knowledge in the discipline, the assessment of the exam is 40% of the final assessment of knowledge in this discipline. Thus, the final score for each discipline is determined as the sum of the points scored by the student according to the results of the current and boundary performance controls (rating - maximum 60 points, minimum 25 points) and the exam (final control - maximum 40 points, minimum 20 points), which together makes up a maximum of 100 points.</p>
Reading list	<ol style="list-style-type: none"> <li>1) Fundamentals of Entrepreneurship, Atameken RK NPI, Methodological guide, Nur Sultan 2019</li> <li>2) Kuratko Donald F. Entrepreneurship: theory, process, practice [Text] : [study.] / D. F. Kuratko; / trans. S. A. Nurova, ed. col.: M. M. Tazhin (pred.), etc. - 10th ed. - - Nursultan : Nats.translation agency, 2019. - 514 p.</li> <li>3) Sklyar E.N. Marketing research: workshop : study. handbook for universities / E. N. Sklyar, G. I. Avdeenko, V. A. Alexunii. - M. Dashkov and K, 2016. - 216 p.</li> <li>4) Leadership / Per. sangl— M.: AlpinapAblisher, 2016, — 224 © . — (Series "NaguagaVizitez; Vemezu 10 best articles")</li> <li>5) The Civil Code of the Republic of Kazakhstan</li> <li>6) The Entrepreneurial Code of the Republic of Kazakhstan</li> <li>7) Administrative Code of the Republic of Kazakhstan</li> <li>8) Tax Code of the Republic of Kazakhstan</li> <li>9) The Law of the Republic of Kazakhstan "On Amendments and Additions to Some legislative Acts of the Republic of Kazakhstan on anti-corruption issues"</li> </ol>

Module designation	<b>Module of physical and mathematical training</b>
Name of disciplines included in this module	<p>5 credits – Mathematics I.</p> <p>5 credits – Physics.</p> <p>5 credits – Mathematics II.</p>
Semester(s) in which the module is taught	Autumn, Spring, 1,2
Person responsible for the module	<p>Tulesheva Gulnara Alipovna</p> <p>Lesbaev Aidos Bakytzhanovich</p>

Language	<i>Kazakh, Russian</i>
Relation to curriculum	<i>Specialisation</i>
Teaching methods	<i>lecture, laboratory work, practical work, calculations.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload:</i> <i>450 hours</i> <i>Lectures 45</i> <i>Laboratory 15</i> <i>Practical 75</i> <i>IWS 315</i>
Credit points	<i>15</i>
Required and recommended prerequisites for joining the module	<i>Diagnostic Test</i>
Module objectives/intended learning outcomes	<p><i>The purpose of the module is to deepen knowledge in the field of mathematics and physics. Prepare the student to independently conduct the necessary research in their professional activities using the basic laws of mathematics and physics using methods of mathematical analysis.</i></p> <p><i>To develop the ability to apply the laws of physics for the formulation, formulation and solution of applied scientific and practical problems.</i></p> <p><i>The key question is: What learning outcomes should students achieve in the module?</i></p> <p><i>For example. from the point of view of:</i></p> <ul style="list-style-type: none"> <li><i>- Knowledge: familiarity with information, theory and/or subject knowledge</i></li> <li><i>Skills: cognitive and practical abilities, for the development of which knowledge is used.</i></li> <li><i>- Competencies: integration of knowledge, skills, social and methodological abilities in work or training situations<sup>2</sup>.</i></li> </ul> <p><i>For example: "Students know that / can / can..."</i></p>
Content	<p><i>The description of the content should clearly indicate the main directions and the level of complexity.</i></p> <p><i>The module covers the following sections: mechanics, dynamics of rotational motion of a solid, mechanical harmonic waves, fundamentals of molecular kinetic theory and thermodynamics, transport phenomena, continuum mechanics, electrostatics, direct current, magnetic field, Maxwell's equations, laws of physics and ways of their application. Solving generalized typical problems of physics in various fields (theoretical and experimental practical training tasks) to form the foundations in solving professional problems, assessing the degree of accuracy of the results of experimental or theoretical research methods. As well as the study of mathematical analysis in a volume that allows you to explore elementary functions and solve the simplest geometric, physical and other applied problems. The main focus is on differential and integral calculus. The sections of the module include differential calculus of functions of one variable, derivative and differentials, the study of the behavior of functions, complex numbers, polynomials. Indefinite integrals, their properties and methods of calculation. Definite integrals and their applications. Improper integrals. Elements of linear algebra and analytic geometry. Differential calculus of a function of several variables and its applications. Multiple integrals. Numerical, power series, Fourier series. Ordinary differential equations of the 1st order. Ordinary differential equations of higher orders. Systems of differential equations.</i></p>

Exams and assessment formats	<p>Two written/oral intermediate tests (30 minutes each) and one final oral exam (40 minutes), short computer quizzes, written homework</p> <p>The module exams are conducted in writing. The examination ticket consists of 3 questions (calculations), for each of which, at the discretion of the teacher, a certain amount of time and points are allocated, however, the total time allocated to the student to provide an answer to the examination ticket should not exceed 120 minutes, and the maximum number of points is 40. And also the teacher adheres to the following evaluation criteria:</p> <ol style="list-style-type: none"> <li>1. Accuracy – 35%.</li> <li>2. Completeness of the solution of the problem – 35%.</li> <li>3. Creativity and originality – 30%.</li> </ol>
Study and examination requirements	<p>Requirements for successful completion of the module for example, the final assessment of the module consists of 60% of the performance in exams, 10% of quizzes, 10% of homework, 10% of class participation. To pass the exam, students must have a final grade of 60% or higher.</p> <p>Admission of students to the exam in the discipline is carried out automatically:</p> <ul style="list-style-type: none"> <li>- based on the assessment of the admission rating, determined by the results of the current and boundary control of academic performance (the total number of required semester points is at least 25 for two attestations);</li> <li>- those who have no outstanding tuition fees;</li> <li>- those who do not have more than 20% of skipping classes in the discipline;</li> <li>- not being on academic leave or academic break;</li> </ul> <p>those who do not have an overdue medical examination.</p> <p>The final assessment of the discipline includes assessments of current academic performance and final control. The assessment of current academic performance (admission rating) is 60% of the final assessment of knowledge in the discipline, the assessment of the exam is 40% of the final assessment of knowledge in this discipline. Thus, the final score for each discipline is determined as the sum of the points scored by the student according to the results of the current and boundary performance controls (rating - maximum 60 points, minimum 25 points) and the exam (final control - maximum 40 points, minimum 20 points), which together makes up a maximum of 100 points.</p>
Reading list	<ol style="list-style-type: none"> <li>1) Suleeva L.B. Electronic textbook. Physics, part 1 "Mechanics. Molecular Physics and Thermodynamics" KazNTU Publishing House 2006</li> <li>2) Trofimova T.I. Physics:500 basic laws and formulas: Handbook for University students. Ed. 3rd – 63 S. M.: Higher School, 1999</li> <li>3) Lungu K.N., Norin V.P. Collection of problems in higher mathematics, part 2, Moscow: Iris Press, 2004.</li> <li>4) Danko P.E., Popov A.G., Kozhevnikov T.Ya. Higher mathematics in exercises and problems. In 2 hours I,2: M.: Higher School, 1999.</li> <li>5) Sobol B.V. Practicum on Higher Mathematics, Rostov n/A: Phoenix, 2006.</li> <li>6) Ryabushko A.P. Collection of individual tasks in higher mathematics. Ch. 1, 2, 3, Minsk.:Higher School, 2006</li> <li>7) Volkenstein V.S. Collection of problems on the general course of physics for students of technical universities Ed. supplement, reprint - 327 p. {Specialist} St. Petersburg: SpetsLit, 2002</li> <li>8) Suleeva L.B. Mechanics and molecular physics. Physical practice. KazNTU Publishing House, 2003.</li> </ol>

Module designation	<b><i>Module of basic training</i></b>
Name of disciplines included in this module	<p>5 credits – <i>Engineering and computer graphics.</i></p> <p>4 credits – <i>The basics of plumbing.</i></p> <p>5 credits – <i>Introduction to the specialty.</i></p> <p>5 credits – <i>Theoretical and applied mechanics.</i></p> <p>6 credits – <i>Hydraulics and hydraulic drive of technological machines.</i></p> <p>5 credits – <i>Interchangeability, standardization and technical measurements.</i></p> <p>5 credits – <i>The branch Materials and Structural Materials Technology.</i></p> <p>5 credits – <i>Strength of materials.</i></p> <p>5 credits – <i>Basics of thermodynamics and heat engineering installations.</i></p> <p>5 credits – <i>Industrial economics.</i></p> <p>5 credits – <i>Bases of designing and details of cars.</i></p> <p>5 credits – <i>Electrotechnics and Microelectronics.</i></p> <p>5 credits – <i>Labor protection.</i></p> <p>4 credits – <i>Structural strength of parts and assemblies of technological machines.</i></p> <p>5 credits – <i>(this block consists of the following elective disciplines: Equipment maintenance system; Fundamentals of the theory of wear of machinery and equipment.</i></p> <p>5 credits – <i>Fundamentals of the theory of reliability of machines and mechanisms.</i></p> <p>5 credits – <i>(this block consists of the following elective disciplines: Internal combustion engines; Gas-pumping units; Gas turbine plants.</i></p> <p>5 credits – <i>(this block consists of the following elective disciplines: Pumps, fans, compressors; Drives of mining machines and stationary options; Drives of technological machines.</i></p> <p>6 credits – <i>(this block consists of the following elective disciplines: Fundamentals of designing technological machines and machine graphics; Computer technologies in operational and service engineering.</i></p> <p>2 credits – <i>Educational practice.</i></p>
Semester(s) in which the module is taught	<i>Autumn, Spring, (1,2,3,4,5,6,7)</i>
Person responsible for the module	<i>Kaliev Bakytzhan Zautbekovich</i>
Language	<i>Kazakh, Russian, English</i>
Relation to curriculum	<i>Specialisation</i>
Teaching methods	<i>lecture, practical work, calculations.</i>
Workload (incl. contact hours, self-study hours)	<p><i>Total workload:</i></p> <p><i>2910 hours</i></p> <p><i>Lectures 465</i></p> <p><i>Practical 375</i></p> <p><i>Laboratory 75</i></p> <p><i>IWS 1995</i></p>
Credit points	<i>97</i>
Required and recommended prerequisites for joining the module	<i>Engineering and computer graphics, Industrial materials science and technology of structural materials, Mathematics I, II.</i>

Module objectives/intended learning outcomes	<p>The purpose of the module is to introduce students to the future specialty, theoretical knowledge, skills and abilities necessary in the design, construction, manufacture and operation of technological machines with elements of standardization, interchangeability, resistance of materials and structural strength of parts and assemblies of technological machines, as well as theoretical and applied mechanics. The study of hydraulics and hydraulic drives, thermodynamics and thermal installations and the basics of the theory of reliability of machines and mechanisms. Prepare for the study of specialized disciplines, solutions to the most important technical problems associated with the creation and development of new most economical materials.</p> <p>To provide knowledge on the development of the main types of design documentation, organization of work on the design of machines at various stages of development with elements of machine graphics and computer-aided design.</p> <p>Will have practical skills in designing typical and specific elements and components of machines using modern regulatory and technical base.</p> <p>Will be able to independently use applied computer technologies and technical means in the design processes of technological machines and equipment.</p> <p>The module develops the following skills among students: to depict all possible combinations of geometric shapes on a plane, to carry out research and their measurements, allowing for image transformations; to create technical drawings, to work with a library of standard programs, which are the main and reliable tools that provide communication between the designer and the designer, the technologist and the performer of machining work. Introduces students to the basics of automated preparation of the graphic part of design documents in the AutoCAD environment.</p> <p>The key question is: What learning outcomes should students achieve in the module?</p> <p>For example. from the point of view of:</p> <ul style="list-style-type: none"> <li>- Knowledge: familiarity with information, theory and/or subject knowledge</li> </ul> <p>Skills: cognitive and practical abilities, for the development of which knowledge is used.</p> <ul style="list-style-type: none"> <li>- Competencies: integration of knowledge, skills, social and methodological abilities in work or training situations<sup>2</sup>.</li> </ul> <p>For example: "Students know that / can / can..."</p>
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Content	<p><i>The description of the content should clearly indicate the main directions and the level of complexity.</i></p> <p><i>The organization of the process of designing engineering objects, the basic principles of construction and structure of computer-aided design systems, the composition and types of support for computer-aided design systems, analysis of the work processes of technological machines using computers, elements of computer-aided design systems of technological machines. Structure and classification of computer-aided design systems, with various types of support for computer-aided design systems. General principles of design of technological equipment. Kinematic schemes of technological machines and equipment, methods of obtaining new technical solutions in the design, design of gearbox housing parts; standard calculation of mechanical gears, design of the main elements of mechanical gears, including using computer-aided design methods</i></p> <p><i>Basics of plumbing</i></p> <p><i>Introduction to the specialty</i></p> <p><i>Theoretical and applied mechanics</i></p> <p><i>Study of the basic laws and concepts of standardization and interchangeability, methods and means of controlling shape deviations, roughness and undulation of surfaces of parts, the role of standardization in improving the quality of machines. The course links the design, production technology and control of products into a single whole. Standardization and unification of parts and elements contribute to speeding up and reducing the cost of designing and manufacturing products.</i></p> <p><i>Pneumatic and hydraulic drilling rigs for drilling boreholes and boreholes. Charging machines and installations. Designs of cyclic and continuous loading machines and excavators. Traction calculations. Machines and complexes for tunneling and cleaning operations. Machines and equipment for carrying out vertical and inclined workings and shafts. Inspection and maintenance of the roof of mining and workings.</i></p> <p><i>The study of methods for obtaining metallic and non-metallic materials used in engineering, objective patterns of dependence of their properties on chemical composition, structure, processing methods and operating conditions, as well as methods of forming blanks, parts and products from these materials. The study of the science of strength, rigidity and stability of materials and structures, preparing it for the correct choice of methods of calculation and design of various structures, in the development of students' logical thinking, independent thinking skills, necessary in further work when solving certain problems of natural science and technology.</i></p> <p><i>Study of electrical and electronic, electrical measuring devices, be able to operate them correctly and draw up technical specifications together with electrical engineers for the development of electrical parts of automated installations for managing production processes. Familiarization with the basic concepts and approaches used in the theory of reliability of mechanical systems, methods for assessing the probability of trouble-free operation of objects in case of sudden and gradual failures. Principles of operation and design of machines designed for ventilation of mine workings, mine drainage and compressed air production. Machines for the preparation of laying mixtures and mechanisms for the construction of shotcrete supports. Ensuring the safe and efficient operation of stationary installations, the ability to design such installations, the choice of equipment, the definition of rational modes of their operation and technical and economic indicators.</i></p>
Exams and assessment formats	<p><i>Two written/oral intermediate tests (30 minutes each) and one final oral exam (40 minutes), short computer quizzes, written homework</i></p> <p><i>The module exams are conducted in writing. The examination ticket consists of 3 questions (calculations), for each of which, at the discretion of the teacher, a certain amount of time and points are allocated, however, the total time allocated to the student to provide an answer to the examination ticket should not exceed 120 minutes, and the maximum number of points is 40. And also the teacher adheres to the following evaluation criteria:</i></p> <ol style="list-style-type: none"> <li><i>1. Accuracy – 35%.</i></li> <li><i>2. Completeness of the solution of the problem – 35%.</i></li> <li><i>3. Creativity and originality – 30%.</i></li> </ol>

Study and examination requirements	<p><i>Requirements for successful completion of the module</i>  <i>for example, the final assessment of the module consists of 60% of the performance in exams, 10% of quizzes, 10% of homework, 10% of class participation. To pass the exam, students must have a final grade of 60% or higher.</i></p> <p><i>Admission of students to the exam in the discipline is carried out automatically:</i></p> <ul style="list-style-type: none"> <li><i>- based on the assessment of the admission rating, determined by the results of the current and boundary control of academic performance (the total number of required semester points is at least 25 for two attestations);</i></li> <li><i>- those who have no outstanding tuition fees;</i></li> <li><i>- those who do not have more than 20% of skipping classes in the discipline;</i></li> <li><i>- not being on academic leave or academic break;</i></li> </ul> <p><i>those who do not have an overdue medical examination.</i></p> <p><i>The final assessment of the discipline includes assessments of current academic performance and final control. The assessment of current academic performance (admission rating) is 60% of the final assessment of knowledge in the discipline, the assessment of the exam is 40% of the final assessment of knowledge in this discipline. Thus, the final score for each discipline is determined as the sum of the points scored by the student according to the results of the current and boundary performance controls (rating - maximum 60 points, minimum 25 points) and the exam (final control - maximum 40 points, minimum 20 points), which together makes up a maximum of 100 points.</i></p>
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Reading list	<p>1) Efremkov A.B., Kazantsev A.A... Blashchuk M.Yu. Mining machines and equipment. Introduction to the specialty. Part 1: the teaching staff. -2nd ed. –Tomsk: Tomsk Polytechnic University, 2009. -153 p.</p> <p>2) Tselikov A.I., Polukhin P.I., etc. Machines and aggregates of metallurgical plants. Textbook for universities in 3 volumes. Volume 1,2,3 – M.: Metallurgy, 1988.</p> <p>3) Smidovich, E.V. Machinery and equipment for oil and gas production: Textbook for universities / E.V. Smidovich. - M.: Alliance, 2016. - 328 p.</p> <p>4) Technology of structural materials: Textbook for students of engineering universities / A.M. Dalsky, T.M. Barsukova, L.N. Bukharkin, etc.; Under the general editorship of A.M. Dalsky. – 5th ed., ispr. – M. Mashinostroenie, 2003. - 511c.</p> <p>5) Technology of structural materials: Textbook for students of engineering universities / A.M. Dalsky, T.M. Barsukova, L.N. Bukharkin, etc.; Under the general editorship of A.M. Dalsky. – 5th ed., ispr. – M. Mashinostroenie, 2003. - 511c.</p> <p>6) Adaskin, A.M. Material science and technology of metallic, nonmetallic and composite materials: Textbook / A.M. Adaskin, A.N. Krasnovsky. - M.: Forum, 2011. - 144 p</p> <p>7) Adaskin, A.M. Material science and technology of metallic, nonmetallic and composite materials: Textbook / A.M. Adaskin, A.N. Krasnovsky. - M.: Forum, 2011. - 144 p</p> <p>8) Yakushev A. I., Vorontsov A. N., Fedotov N. M. "Interchangeability, standardization and technical measurements" Mechanical engineering 1986.</p> <p>9) Tuleuov K.T., Myrzakhmetov B.A. Fundamentals of heat transfer. Study guide. – Almaty: KazNTU, 2006</p> <p>10) Organization and planning of production: Practicum / N. I. Novitsky. – Mn.: New knowledge, 2004.</p> <p>11) Fundamentals of production organization: Textbook / Ed. Volkov K.A. Economics, 2001.</p> <p>12) Samokhvalov M.A. Installation and operation of drilling equipment – Tomsk: Publishing House of Tomsk Polytechnic University, 2010. – 312 p.</p> <p>13) Bulatov A.I., Proselkov N.M., Shamanov S.A. Technique and technology of drilling oil and gas wells: Studies, for universities. - M.: LLC "Nedra-Businesscenter" 2003.</p> <p>14) Dmitriev A.Yu. Fundamentals of well drilling technology – Tomsk: TPU Publishing House, 2008. - 216 p.</p> <p>15) Shestopalov E.M. Computer-aided design systems of machines and equipment: textbook.- method. Complex. – Novopolotsk: PSU, 2008. – 272</p> <p>16) Polishchuk V.V., Polishchuk A.V. AutoCAD 2013. Practical guide. – M.:DIALOG – MEPhI, 2009. – 528 p.</p> <p>17) Lelikov O.P. Fundamentals of calculation and design of machine parts and assemblies. – M.: Mechanical Engineering, 2004.</p> <p>18) Markova L.N. Automated workplaces during the operation of GM iEMO. Almaty: - KazNTU, 2006.</p> <p>19) Shevyakova D.A., Stepanov A.M., Karpov R.G. VisualBasic Tutorial 2005.– S.P.: BHV – St. Petersburg, 2006.</p> <p>20) Markova L.N. Development of the application interface for the ARM during GM and EMO operation. - Almaty: KazNTU, 2004.</p> <p>21) Markova L.N. Project creation for ARM during the operation of GM iEMO. Almaty: KazNTU, 2004.</p> <p>22) Chichenev N.A. Reliability.technological machines — M.: Publishing house.NUST MISIS, 2019 — 264 p.</p> <p>23) Reliability of machines and mechanicsuchebnik V. A. Cherkasov, B. A. Kaitukov, P. D. Kapyrin, etc.; edited by B. A.Kaitukov, V. I. Skel-M.: MGSU, 2015- 272 p.</p>
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Module designation	<b><i>Module of professional activity</i></b>
Name of disciplines included in this module	<p>5 credits – Technology of repair and operation of technological machines.</p> <p>5 credits – Instrumentation and automation of technological machines.</p> <p>6 credits – Installation and assembly production of technological machines.</p> <p>4 credits – Technical diagnostics of technological equipment.</p> <p>5 credits – (this block consists of the following elective disciplines: Mining and transport machines; Equipment for metallurgical plants; Machinery and equipment for drilling oil and gas wells.</p> <p>4 credits – (this block consists of the following elective disciplines: Experimental technique; Design of experiments bench and field tests.</p> <p>6 credits – (this block consists of the following elective disciplines: Tribonika and Tribotechnics; Fuels, oils and special liquids.</p> <p>5 credits – (this block consists of the following elective disciplines: Technology maintenance and repair of compressor units and hydraulic machines; Welding technologies in repair and service production; Machines and equipment of pumping and compressor stations; Theory and practice of project management.</p> <p>5 credits – (this block consists of the following elective disciplines: Operation and maintenance of drainage and pneumatic installations; Operation and maintenance of dust and gas cleaning equipment and recycled water supply; Equipment and technology of well repair and maintenance.</p> <p>5 credits – (this block consists of the following elective disciplines: Industrial safety in the oil and gas industry; Industrial safety in an industrial cluster.</p> <p>5 credits – (this block consists of the following elective disciplines: Fundamentals of energy saving in repair and service production; Robotic complexes in metallurgical production; Energy-saving technologies in repair and service production in the oil and gas industry.</p> <p>2 credits – Production practice I.</p> <p>3 credits – Production practice II</p>
Semester(s) in which the module is taught	Spring, Autumn (6, 7)
Person responsible for the module	Myrzakhmetov Beibit Abikenovich Beisenov Baurzhan Sakkouly
Language	Kazakh, Russian, English
Relation to curriculum	Specialization
Teaching methods	lecture, laboratory work, practical work, calculations.
Workload (incl. contact hours, self-study hours)	<p>Total workload:</p> <p>1800 hours</p> <p>Lectures 330</p> <p>Laboratory 15</p> <p>Practical 255</p> <p>IWS 1200</p>
Credit points	60
Required and recommended prerequisites for joining the module	Physics, Mathematics I, Mathematics II, Fundamentals of Plumbing, Introduction to the specialty, Theoretical and applied Mechanics, Hydraulics and Hydraulic drive of technological machines, Interchangeability, standardization and technical measurements, Industrial Materials Science and technology of structural materials, Resistance of materials, Fundamentals of design and operation of machines, Structural strength of parts and assemblies of technological machines.

Module objectives/intended learning outcomes	<p><i>The purpose of the module is to prepare a future specialist for production activities in the field of installation and operation of the main production equipment, assessment of the technical condition, features of the technological process of production preparation.</i></p> <p><i>Knows the structure of the production process of the mining and metallurgical and oil and gas sectors of the industry; technical operating conditions of machines and installations; rules for working with devices and devices.</i></p> <p><i>He is able to perform technological operations for adjusting machines and mechanisms and works of medium complexity for periodic maintenance of machines using modern maintenance tools; identify simple malfunctions of machines and equipment and independently perform locksmith work to eliminate them; draw up primary documentation.</i></p> <p><i>The key question is: What learning outcomes should students achieve in the module?</i></p> <p><i>For example. from the point of view of:</i></p> <ul style="list-style-type: none"> <li><i>- Knowledge: familiarity with information, theory and/or subject knowledge</i></li> <li><i>Skills: cognitive and practical abilities, for the development of which knowledge is used.</i></li> <li><i>- Competencies: integration of knowledge, skills, social and methodological abilities in work or training situations<sup>2</sup>.</i></li> </ul> <p><i>For example: "Students know that / can / can..."</i></p>
Content	<p><i>The description of the content should clearly indicate the main directions and the level of complexity.</i></p> <p><i>Forms of organization and methods of assembly of technological machines and equipment. Rigging, rigging facilities, rigging structures. Acceptance of foundations for installation of equipment. Geodetic support of installation. Methods of installing machines on the foundation and carrying out installation. Installation of pipelines, overhead cranes, continuous transport machines. Operational properties of technological machines. Operational properties of elements of technological machines subject to temperature, corrosion.</i></p> <p><i>Wear and aging of technological machines and equipment. Design of repair production. Organization and management of the electromechanical service. Basic information on methods of repair, improvement of technological equipment. Engineering support of repair. Identify defects in the components of machines and aggregates, instilling students with practical skills necessary for the repair and operation of mining and metallurgical production equipment. Technologies for restoring worn parts.</i></p>
Exams and assessment formats	<p><i>Two written/oral intermediate tests (30 minutes each) and one final oral exam (40 minutes), short computer quizzes, written homework</i></p> <p><i>The module exams are conducted in writing. The examination ticket consists of 3 questions (calculations), for each of which, at the discretion of the teacher, a certain amount of time and points are allocated, however, the total time allocated to the student to provide an answer to the examination ticket should not exceed 120 minutes, and the maximum number of points is 40. And also the teacher adheres to the following evaluation criteria:</i></p> <ol style="list-style-type: none"> <li><i>1. Accuracy – 35%.</i></li> <li><i>2. Completeness of the solution of the problem – 35%.</i></li> <li><i>3. Creativity and originality – 30%.</i></li> </ol>

Study and examination requirements	<p><i>Requirements for successful completion of the module</i>  <i>for example, the final assessment of the module consists of 60% of the performance in exams, 10% of quizzes, 10% of homework, 10% of class participation. To pass the exam, students must have a final grade of 60% or higher.</i></p> <p><i>Admission of students to the exam in the discipline is carried out automatically:</i></p> <ul style="list-style-type: none"> <li>- <i>based on the assessment of the admission rating, determined by the results of the current and boundary control of academic performance (the total number of required semester points is at least 25 for two attestations);</i></li> <li>- <i>those who have no outstanding tuition fees;</i></li> <li>- <i>those who do not have more than 20% of skipping classes in the discipline;</i></li> <li>- <i>not being on academic leave or academic break;</i></li> </ul> <p><i>those who do not have an overdue medical examination.</i></p> <p><i>The final assessment of the discipline includes assessments of current academic performance and final control. The assessment of current academic performance (admission rating) is 60% of the final assessment of knowledge in the discipline, the assessment of the exam is 40% of the final assessment of knowledge in this discipline. Thus, the final score for each discipline is determined as the sum of the points scored by the student according to the results of the current and boundary performance controls (rating - maximum 60 points, minimum 25 points) and the exam (final control - maximum 40 points, minimum 20 points), which together makes up a maximum of 100 points.</i></p>
Reading list	<ol style="list-style-type: none"> <li>1) Ivanov, O. O., Kormiltsin G. S. <i>The Basics of installation and repair of technological equipment : yeb. posobie / Tambov: Tamb. Gos. techn. in UN, 2001.</i></li> <li>2) Beisenov B. S. <i>installation and operation of technological machines. - Almaty, Kazntu, 2015.</i></li> <li>3) Adilbayev M. K. <i>mechanical equipment of metallurgical plants. Textbook, Kazntu. Almaty, 2001.</i></li> <li>4) Anistratov Yu.I., Anistratov K. Yu. <i>technology of open Mountain work: Yuchbnik-m:2008 - 472c.</i></li> <li>5) Sinchkovsky V. N. <i>technology of open Mountain work: educational post. Krasnoyarsk, 2009</i></li> <li>6) Tugunov P. I., Novoselov V. F., Korshak A. A., Shammazov a.m. <i>Typov reports on the projection and operation of neftebaz and nefteprovodov. - UFA: Izdatelstvo OOO "Designpoligrafservice", 2002.</i></li> <li>7) Beisenov B. S. <i>dynamics and efficiency of metallurgical equipment. "I don't know," he said.- Almaty, Kazntu, 2005.</i></li> <li>8) <i>Road transport in quarries. Designs, operation, calculation / Kvaginidze V.S., Kozovoy G.I., Chakvetadze F.A., Antonov Yu.A., Koretsky V.B. -2017 - 408p.</i></li> <li>9) <i>Transport vehicles / Galkin V.I., Sheshko E.E. - Publisher: Mining book. -2010 – 588p.</i></li> <li>10) <i>Mining transport vehicles (theory and calculations) / Kuzmenko V.I. Tutorial. - Alchevsk: DGMI, 2001. -232 p.</i></li> <li>11) <i>Transport machines and complexes of open development: A textbook for university students studying in the specialty "Mining machines and complexes" / V.A. Dyakov.- Moscow: Nedra, 1986-343p.</i></li> <li>12) <i>Soloviev V.V., Selivanov D.G. Pumps and compressors. Lecture course. Tutorial. - Ukhta: USTU, 2015.- 67 p.</i></li> <li>13) <i>Dmitriev E.A., Morgunova E.P., Komlyashev R.B. (comp.) Chemical industry pumps. Teaching aid. - M.: RKhTU im. DI. Mendeleev, 2013.</i></li> <li>14) <i>Operation of technological equipment: textbook / N.A. Chichenev. -M: Izd.Dom MISiS, 2015.</i></li> <li>15) <i>Polyushkin, N.G. Fundamentals of the theory of friction, wear and lubrication: textbook, allowance / N.G. Polyushkin; Krasnoyar. state agrarian un-t. - Krasnoyarsk, 2013. - 192 p.</i></li> <li>16) <i>Technological machines and equipment / A. V. Gilev, V. T. Chesnokov [and others]; under total ed. A. V. Gileva; Sib. federal, un-t, Institute of Mining, Geology and Geotechnologies. - Krasnoyarsk: SFU, 2017. – 272</i></li> </ol>

Module designation	<b><i>Module of final attestation</i></b>
Name of disciplines included in this module	<i>6 credits – Preparation and writing of a thesis (project). 6 credits – Defense of the thesis (project)</i>
Semester(s) in which the module is taught	<i>Spring (8)</i>
Person responsible for the module	<b>Bortebayev Sain Abilhanovich</b>
Language	<i>Kazakh, Russian, English</i>
Relation to curriculum	<i>Specialization</i>
Teaching methods	<i>lecture, laboratory work, practical work, calculations.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload: 360 hours</i>
Credit points	<i>12</i>
Required and recommended prerequisites for joining the module	Students who have successfully mastered the theoretical undergraduate course in the amount of at least 240 academic credits are admitted to the project.
Module objectives/intended learning outcomes	<p><i>The thesis (project) is a graduation work, which is done in electronic form at the final stage of training, if it is provided by the state compulsory standard of education and the curriculum of the specialty.</i></p> <p><i>The purpose of the thesis (project) is: 1) systematization, consolidation and expansion of theoretical knowledge and practical skills in the specialty and their application in solving specific scientific, technical, economic and industrial problems, as well as cultural purposes; 2) development of skills for conducting independent work and mastering the methodology of scientific research and experimentation in solving the developed problems and issues; 3) finding out the readiness of the student for independent work in the conditions of modern production, science, technology, culture, as well as the level of his professional competence.</i></p> <p><i>The thesis (project) is a summary of the results of independent study and research of the actual problem of a particular specialty in the relevant field of science.</i></p>

Content	<p><i>In terms of its content, a project is a research work or design solution prepared by a graduate student of a higher educational institution independently or as part of a group in a specific field of activity in the form of a manuscript.</i></p> <p><i>Registration of the project is regulated by ST KazNRTU - 09 - 2017 General provisions for the construction, presentation, and content of text and graphic material:</i>  <a href="https://official.satbayev.university/ru/vnutrennie-normativnye-dokumenty/2-uroven-standardy-kaznitu">https://official.satbayev.university/ru/vnutrennie-normativnye-dokumenty/2-uroven-standardy-kaznitu</a></p> <p><i>The volume of the project must be at least 30 pages of original text for individual work and at least 50 pages of original text for group work. Appendixes are not included in the specified volume of the project.</i></p> <p><i>Abstract in Kazakh, Russian and English languages should contain: - information about the amount of work, the number of illustrations, tables, sources used; - a list of keywords characterizing the content of the final work; - goals and objectives of the work, the methods and equipment used, the results obtained and their practical use. The volume of the abstract should not exceed 1000 characters.</i></p> <p><i>The content of the project includes an introduction, serial numbers and titles of all sections, subsections, conclusion, list of references and titles of appendixes indicating the page numbers from which these elements of the project begin.</i></p> <p><i>The introduction should contain a rationale for the relevance of the topic of the project and an assessment of the current state of the scientific or practical problem being solved, and the goal, objectives and object of the project should also be given. The volume of the introduction cannot exceed 3 pages.</i></p> <p><i>In the main part of the project, data is given that reflects the essence, content, methodology and main results of the work performed. The main part of the project, as a rule, is divided into sections and subsections (chapters and paragraphs).</i></p> <p><i>The conclusion (conclusions) should contain brief conclusions on the results of the diploma research, an assessment of the completeness of the solutions to the tasks set, specific recommendations on the studied object of study. The volume of the conclusion cannot exceed 1 page.</i></p> <p><i>The list of used literature is drawn up in accordance with the established requirements for scientific papers. <a href="https://allgosts.ru/01/140/gost_7.32-2017">https://allgosts.ru/01/140/gost_7.32-2017</a></i></p> <p><i>The application includes materials related to the completion of the thesis research, which are not reflected in the main part.</i></p> <p><i>For the accepted accuracy and objectivity of all data in the project, the responsibility lies on the student - the author of the project.</i></p>
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Exams and assessment formats	<p><i>The procedure for defending a project is determined by the Rules of the credit technology of education of KazNRTU. The project is defended at an open meeting of the state attestation commission with the participation of at least half of its members. The defense of the project is organized in a public form, with the presence of students, teachers of the graduating department and others. The supervisor, representatives of the organization on the basis of which the thesis research was conducted and other interested persons can be invited to the defense. The duration of the defense of one individual project, as a rule, should not exceed 30 minutes and no more than 50 minutes for a group one.</i></p> <p><i>To defend the thesis, the graduate makes a presentation to the state attestation commission and presents it for no more than 10 minutes.</i></p> <p><i>All those present people can take part in the discussion of the project in the form of questions or speeches.</i></p> <p><i>After the discussion, the secretary of the commission reads out a review (if present, the supervisor can speak in person). If there are comments in the review, the student must give a reasoned explanation of their essence.</i></p> <p><i>Based on the results of defending the project, an assessment is made according to the point-rating letter system.</i></p> <p><i>When assessing a graduate (a group of graduates), the State Attestation Commission is guided by the following assessment criteria: - General basic literacy of the graduate - Professional competence of the graduate - Accuracy and accuracy of the work (project) - Completeness of the work (project) - Originality and creativity in the execution of the work (project)</i></p> <p><i>- Oratory and communication skills in the presentation of work - The opinion of the supervisor.</i></p> <p><i>Each member of the commission gives points for each evaluation criterion and sets the total final score in the statement in accordance with Appendix 3.</i></p> <p><i>The final score of each member of the commission is set by the secretary of the commission with a general statement based on the results of which the final score of the commission is set.</i></p> <p><i>The results of the thesis defense are documented in the minutes of the meeting of the state attestation commission individually for each student and are announced on the day of the defense.</i></p> <p><i>The results of the final attestation and defense of theses (projects) issued by the decision of the State Attestation Commission are not subject to appeal.</i></p> <p><i>In the event that a graduate admitted to the defense does not appear, another date for the defense may be assigned to him for defense by decision of the State Attestation Commission. In the event that a graduate admitted to the defense does not appear for defense during this period of the meeting of the State Attestation Commission, his defense can be held in another academic period according to the academic calendar on a paid basis.</i></p> <p><i>If a graduate receives an F (unsatisfactory) grade in the final attestation and defense of the project, the procedure for preparing, writing and defending the project must be carried out again in the next academic period on a new given topic of work. Working with the same supervisor is allowed.</i></p>
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Study and examination requirements	<p><i>Before the electronic signing of the project, the supervisor is obliged to make sure that the structural presentation and design of the work is correct, and also to request a certificate of borrowing of the work from the university database of the Anti-Plagiarism System. The student is obliged to submit the final version of the thesis for verification by the System no later than two weeks before the official defense. Without this certificate, the work cannot be signed by the supervisor.</i></p> <p><i>Similarity reports should always be reviewed by the supervisor. Audited work should not be judged solely on the basis of (percentage) rates of Similarity Coefficient. The supervisor should check the contents of the document - whether the citations are correctly indicated, and whether they are borrowed from the documents listed in the bibliography. The system does not determine the priority of creating documents, i.e. which document was created earlier - analyzed or found by the System and accepted as a source. Thus, even in the case of uncertainty, the user cannot determine on the basis of the Similarity Report which document is the original and which is the copy. This conclusion can only be reached after a deeper analysis of the document.</i></p> <p><i>Exceeding the set value in the Similarity Coefficient #1 means excessive use of borrowings, such as: "we must not forget that" or "we can say that". Since all languages have commonly used phrases of five or more words, exceeding the set value of the Similarity Coefficient #1 only gives a general idea of the possibility of plagiarism and requires additional verification by the Supervisor. However, the value of these terms in the total volume of borrowings, as well as their influence on the percentage of the Similarity Coefficient #2, should not exceed 10 percent. The Similarity Coefficient #2 more accurately determines borrowings found in the checked document. Its value is calculated in the same way as for Similarity Coefficient #1, but it identifies phrases of 25 words. Supervisors are encouraged to do a detailed analysis of all reports in which the Similarity Coefficient #2 exceeds 5 percent. Exceeding the set value of the Similarity Coefficient #2 is a reliable signal about the identification of unacceptable borrowings in the document. The presence of borrowings requires verification by the Supervisor, as this may be a fact of copying someone else's content (for example, the correct labeling of the quote). Authors of papers that have not been verified using the System have the right to finalize and re-check them within the time limits set by the Supervisor, but no more than 5 calendar days.</i></p> <p><i>Checking for plagiarism of one's work can be carried out no more than 3 times. The first check is at the expense of the university, and subsequent checks are at the expense of the author.</i></p> <p><i>If a negative conclusion is received during the third check using the system, the work is not allowed for defense.</i></p> <p><i>With a slight deviation from the established values (Similarity Coefficient No. 1 - from 51% to 60%, Similarity Coefficient No. 2 - from 6% to 10%), the final decision on admission to the defense of the work is made by the Supervisor and the head of the relevant department.</i></p> <p><i>On the basis of the Similarity Report, the Supervisor and the Head of the Department draw up a "Protocol of the Analysis of the Similarity Report by the Supervisor" and, if necessary, a "Protocol of the Analysis of the Similarity Report of the Head of the Department", where a decision is made on the admission / nonadmission of the final work for protection.</i></p> <p><i>Protocols for the analysis of the Similarity Report of the Supervisor and the Head of the Department are issued in two copies, one of which is enclosed in the final work along with the Supervisor's review and general review, and the other is transferred to the Registrar's Office to be attached to the personal file of the Author. In case of approval of the project by the Diploma Council, the supervisor signs the work (project) with an electronic signature and, together with his opinion on admission to defense, submits it to the head of the department three weeks before the official defense.</i></p>
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	<p><i>In case of disapproval of the project, the Diploma Council and the supervisor write a reasonable electronic review and provide it no later than a week after the preliminary defense, and the supervisor does not sign the work (project).</i></p> <p><i>Based on these materials, the head of the department makes the final decision on this project, making an appropriate entry on its title page. In the event that the Council and the supervisor do not consider it possible to allow the student to defend the project, this issue is considered at a meeting of the department with the obligatory participation of this student, the Diploma Council, including the supervisor.</i></p> <p><i>The completed project, which has successfully passed the check for borrowings in the System, drawn up in accordance with the established requirements, signed by the supervisor and the head of the department, is sent for defense at the State Attestation Commission, and uploaded to a special portal of Diploma works no later than two weeks before official protection. The student (a group of students) must make an official announcement on the website about the defense of their work (project) - before May 1st, the 4th year of study.</i></p> <p><i>Defense of the project at the request of the student is carried out in Kazakh, Russian or English. The defense of the project can be carried out using electronic resources in the form of multimedia presentations based on modern technical means and achievements in the field of information and communication technologies;</i></p> <p><i>The project is signed on the title page and stored at the department in electronic form.</i></p>
Reading list	<i>in the direction of the theme of the graduation project</i>