

**MINISTRY OF HIGHER EDUCATION, SCIENCE AND
INNOVATIONS OF THE REPUBLIC OF UZBEKISTAN**

KARSHI STATE UNIVERSITY

MODULE HANDBOOK

Field of Knowledge: 500000 – Natural sciences, mathematics and statistics

Field of Education: 540000 – Mathematics and statistics

Field of Study: 60540100 – Mathematics

Module name:	THE LATEST HISTORY OF UZBEKISTAN
Code, if applicable:	O`zT1105
Semesters in which the module is taught:	1
Lecturer:	Sulaymanova Soxiba, senior teacher Quvvatova Nodira, senior teacher Tuxtayeva Ra'no, senior teacher
Language	Uzbek
Relation to curriculum:	Compulsory
Type of teaching, contact hours:	Lecture, practical
Workload:	150 hours Contact hours: 60 hours; lecture – 30 hours; practical – 30 hours Self-study: 90 hours
Credit points:	5
Recommended prerequisites:	History of Uzbekistan Archaeology Historical geography Medieval Uzbekistan Source studies

Module objectives Intended learning outcome	The essence of the historical path that our country has taken during the years of independence, the significance of the changes that have taken place in the recent history of Uzbekistan; Knows how to comprehensively analyze the aspects of the relationship between the development of statehood and international relations; Knows from the perspective of historicity and objectivity the processes of integration of Uzbekistan with the world community, ensuring security, interethnic harmony and religious tolerance, increasing the role and influence of the Republic of Uzbekistan in international ratings and indices in modern processes;
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	Learns to analyze the uniqueness of historical processes in different periods of the recent history of Uzbekistan; Knows how to use the idea of national independence in studying the problems of the recent history of Uzbekistan, strengthening the worldview, Acquires the skills to express their attitude to the processes taking place around them, and to understand the role of history in the development of society and human worldview; will acquire the skills to understand the connection between current events and important events in history. will acquire the skills to apply the knowledge acquired in the subject in scientific research and scientific and pedagogical activities, and to conduct research on current issues of the history of statehood.
Content	Lecture 1. Introduction. The subject, goals and objectives of the academic discipline “The Latest History of Uzbekistan”, theoretical and methodological principles. Lecture 2. Historical foundations of the ideas of independence in Uzbekistan Lecture 3. Historical foundations of the ideas of independence in Uzbekistan Lecture 4. Historical foundations of the ideas of independence in Uzbekistan Lecture 5. Socio-political processes in Uzbekistan on the eve of independence Lecture 6. The historical significance of the formation of the independent Republic of Uzbekistan. The unique path of independence and development of Uzbekistan. Lecture 7. The formation of the foundations of democratic, civil society in Uzbekistan, the implemented political reforms. Lecture 8. Economic reforms, the formation of private ownership. The development of market relations in Uzbekistan. Lecture 9. Reforms in the social sphere in the Republic of Uzbekistan. Lecture 10. Spiritual and cultural development in Uzbekistan during the years of independence. Lecture 11. Reforms implemented in the field of education in the Republic of Uzbekistan. Lecture 12. Uzbekistan and the world community. Lecture 13. Reflection of changes taking place in the socio-political, economic and cultural life of New Uzbekistan in international ratings and indices Lecture 14. Reforms implemented in New Uzbekistan under the leadership and initiative of President Sh.M. Mirziyoyev Lecture 15. The socio-political significance of building a people's and humane state in New Uzbekistan. Seminars

	Seminar 1. Introduction. The subject, goals and objectives of the academic discipline "The Latest History of Uzbekistan", theoretical and methodological principles. Seminar 2. Historical foundations of the ideas of independence in Uzbekistan Seminar 3. Historical foundations of the ideas of independence in Uzbekistan Seminar 4. Historical foundations of the ideas of independence in Uzbekistan Seminar 5. Socio-political processes in Uzbekistan on the eve of independence Seminar 6. The historical significance of the formation of the independent Republic of Uzbekistan. The unique path of independence and development of Uzbekistan. Seminar 7. Formation of the foundations of democratic, civil society in Uzbekistan, implemented political reforms. Seminar 8. Economic reforms, the formation of private ownership. Development of market relations in Uzbekistan. Seminar 9. Reforms in the social sphere in the Republic of Uzbekistan. Seminar 10. Spiritual and cultural development in Uzbekistan during the years of independence. Seminar 11. Reforms implemented in the field of education in the Republic of Uzbekistan. Seminar 12. Uzbekistan and the world community. Seminar 13. Reflection of changes taking place in the socio-political, economic and cultural life of New Uzbekistan in international ratings and indices Seminar 14. Reforms being implemented in New Uzbekistan under the leadership and initiative of President Sh.M. Mirziyoyev Seminar 15. The socio-political significance of building a people-oriented and humane state in New Uzbekistan
Study and examination requirements and forms of examination	Types of control and assessment criteria The student must fully master the theoretical and methodological concepts of the subject, be able to correctly reflect the results of the analysis, independently observe the processes being studied, and complete the tasks and assignments given in the current, intermediate and final types of control. 1. The maximum sum of the current and intermediate control points is 50 points, and the qualifying score is 30 points. Tasks (tests, oral or written questions, case studies, etc.) for the current and intermediate types of control are compiled in a ratio of 40/60 or 50/50, based on the ratio of the audience (lecture, practical, laboratory and seminar) and independent study hours allocated to this subject. 2. The maximum score of the final control is 50 points. Assignments for the final type of control (tests, oral or written

	questions, case studies, etc.) are compiled in a ratio of 40/60 or 50/50, based on the ratio of classroom hours (lectures, practical, laboratory and seminar) and independent study hours allocated to this subject. 3. If the sum of the current and intermediate control points is less than 30 points or a student who misses 25 percent or more of the classroom hours allocated to the subject without a reason is excluded from this subject and is not included in the final control and is considered not to have mastered the relevant credits in this subject. A student who is not included or has not entered the final control type, as well as who has received an unsatisfactory grade in this type of control, that is, has not been able to collect a qualifying score (30 points), is considered to be an academic debtor. In such cases, the student re-masters the subject within the specified time limits.
Media employed	- lectures; - interactive case studies; - seminars (logical reasoning, quick questions and answers); - group work; - presentations; - individual projects.
Reading list	1. R.H. Murtazayeva O‘zbekistonda millatlararo munosabatlar va tolerantlik. Darslik. - Toshkent: Mumtoz so‘z, 2019. 2. R.H.Murtazayeva, A.A.Yermetov, A.A.Odilov va boshq. O‘zbekistonning eng yangi tarixi. - Toshkent, 2024. 3. A.S.Sagdullayev umumiy tahriri ositida. O‘zbekiston tarixi. 1-jild. Darslik. – Toshkent: NIF MSH. 2024. 3. B.J.Eshov, A.A.Odilov. O‘zbekiston tarixi. 2-jild. Darslik. – Toshkent: NIF MSH. 2024. 4. K.D.Saipova. Noveyshaya istoriya Uzbekistana (uchebnoe posobie). –Tashkent: NIF MSH, 2024.
Reviewers	B.J. Eshov – Professor of the Department of History of Uzbekistan, Doctor of Philosophy O.A. Rahmonkulova - Associate Professor of the Department of History of Uzbekistan, Doctor of Philosophy.
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 15. 09. 2025)

Module name:	PHILOSOPHY
Code, if applicable:	FAL 1402
Semesters in which the module is taught:	2
Lecturer:	Tohir Qurbonov

Language	Uzbek
Relation to curriculum:	Compulsory
Type of teaching, contact hours:	Lecture, practical
Workload:	Total -120 Contact hours: 60 hours; lecture – 30 hours; practical – 30 hours Self-study: 60 hours
Credit points:	4
Recommended prerequisites:	Psychology History Religion

Module objectives Intended learning outcome	It is aimed at creating a generalized system of students' worldview and showing the human mind in it, forming a person's knowledge of the world, socio-political, moral, aesthetic and other relations, and teaching the skills of correct thinking. To properly organize professional activities based on the study of the most ancient and modern philosophical knowledge about the world, to increase social responsibility, to form a sense of involvement in state policy; to independently analyze social processes; To have an idea of the main ideas of ancient, medieval and modern philosophy, the role of Eastern philosophy in the development of society, the philosophical content of Western philosophical movements, the essence of the Western Renaissance, the influence of medieval Eastern science and philosophy on its formation, and the important features of Western philosophy of the New and most modern eras; The directions of new ontology, the social significance of gene ontology, bioontology, medical ontology, the relationship and differences between physical and philosophical ontology, the protection of human and social interests in the use of technologies in an information society, the role of the biosphere and noosphere in the ontology of nature, social ecology, and environmental education and upbringing are all known and can be used.
Content	Training format: lecture 1. Philosophy and its role in the life of society. 2. Stages of development of philosophical thought: Eastern philosophy.

	3. Stages of development of philosophical thought: Western philosophy. 4. Philosophy of being (ontology) and development. 5. Philosophy of knowledge (epistemology). 6. Logic. 7. Forms of thought: concept, judgment and conclusion. 8. Philosophy of society. 9. Philosophy of man (Philosophical anthropology). 10. Philosophy of values (axiology). 11. Philosophy of morality (Ethics) 12. Philosophy of aesthetics (Aesthetics). 13. Philosophy of globalization and sustainable development. 14. World experience in combating corruption. 14. Anti-corruption policy of Uzbekistan. Form of classes: practical 1. Philosophy and its role in the life of society. 2. Stages of development of philosophical thought: Eastern philosophy. 3. Stages of development of philosophical thought: Western philosophy. 4. Philosophy of being (ontology) and development. 5. Philosophy of knowledge (epistemology). 6. Logic. 7. Forms of thought: concept, judgment and conclusion. 8. Philosophy of society. 9. Philosophy of man (Philosophical anthropology). 10. Philosophy of values (axiology). 11. Philosophy of morality (Ethics). 12. Philosophy of sophistication (Aesthetics). 13. Philosophy of globalization and sustainable development. 14. World experience in combating corruption.
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	15. Anti-corruption policy of Uzbekistan.
Study and examination requirements and forms of examination	a) To receive a grade of 5, the student's level of knowledge must meet the following requirements: ☐ can fully explain the essence and content of the subject; ☐ maintains scientificity and logic in presenting the topics in the subject, avoiding scientific errors and confusion; ☐ has a clear idea of the theoretical or practical significance of the subject materials in the subject; ☐ can demonstrate the ability to think independently within the scope of the subject; ☐ can answer the questions asked clearly and concisely; ☐ has carefully prepared the outline; ☐ has completed independent assignments completely and clearly; ☐ has fully mastered the laws and other regulatory and legal documents related to the discipline; ☐ has published a scientific article on one of the topics related to the discipline; ☐ can interpret historical processes; b) To receive a grade of 4, the student's level of knowledge must meet the following requirements: ☐ understands the essence and content of the subject, does not allow scientific and logical confusion in explaining the topics in the subject; ☐ understands the practical significance of the content of the subject; ☐ performs the assigned tasks and assignments within the framework of the curriculum; ☐ can correctly answer the questions asked in the subject; ☐ has carefully formulated a subject outline; ☐ has fully completed independent assignments in the subject; ☐ has mastered laws and other regulatory documents related to the subject. c) To receive a grade of 3, the student's level of knowledge must meet the following criteria: ☐ has a general understanding of the subject; ☐ covers the topics of the subject in a narrow range, with some inconsistencies in the presentation; ☐ is not fluent in the presentation; ☐ if complex and confusing answers are given to questions on the subject; ☐ if the text on the subject is not well-structured. g) In the following cases, the student's level of knowledge may be assessed as unsatisfactory with a grade of 2: ☐ if preparation for the subject exercises is not carried out; ☐ if the student has no idea about the subject exercises; ☐ if it is noticeable that the texts on the subject have been copied from others; ☐ if serious errors and confusions are made in the text on the subject; ☐ if the questions asked about the subject are not answered; ☐ if the subject is not known.

Media employed	Some of the most effective methods of pedagogical technologies are the use of "Problem Situation", "FSMU", "Fish Skeleton", "Cluster" and "Why", "How" organizers in the educational process, presentation, brainstorming Blitz, discussion, question and answer technologies.
Reading list	1.Davronov Z., Shermuhamedova N, Qahharova M, Nurmatova M, Husanov B, Sultonova A. Falsafa. - Toshkent: TMU, 2019 Madaeva Sh. Shermuhamedova N. va boshqalar. Falsafa - o'quv qo'llanmasi. - Toshkent: 2019 2.Muhammadjonova L.A., Abdulla Sher, Shodimetova G. Axloq falsafasi. - Toshkent: Vneshinvestprom, 2023 3.Saifnazarov I. Muxtorov A., Sultanov T., Usmonov F. Falsafa. Darslik. - T.: Innovatsion rivojlanish nashriyot - matbaa uyi, 2021.- 424 b. 4.Saifnazarov I.C, Abdullaxonova., Ernazarov D.Z. Filosofiya (Logika,Etika, Estetika) Uchebnoe posobie dlya vysshih uchebnykh zavedeniy. LAMBERT Akademik Publishing RU. 2019. -134 str 5.Shermuhamedova N. Falsafa. - Toshkent: Idris Abdurauf Nashr, 2021. 667-b.
Reviewers	Taqrizchilar Falsafa va sotsiologiya kafedrası professori Choriyev S.A. SHDPI+Ijtimoiy fanlar kafedrası dotsenti f.f.d.(DSc) Omonov B.N.
Confirmed place and time	Tasdiqlagan tashkilot va vaqti Developed and approved by Karshi State University (Report № 1 02. 09. 2025)

Module name:	Foreign language (English)
Code, if applicable:	XorT11207
Semesters in which the module is taught:	1/2
Lecturer:	Murodov Shuhrat, senior teacher
Language	Uzbek / English
Relation to curriculum:	Compulsory
Type of teaching, contact hours:	Lecture, practical
Workload:	210 hours Contact hours: 90 hours; practical – 90 hours Independent study: 120 hours

Credit points:	7
Recommended prerequisites:	English Lexicology English Grammar Practice of reading and writing

Module objectives Intended learning outcome	The module aims to develop the four core language skills - reading comprehension, listening comprehension, writing, and speaking - in an integrated manner, enhance communication abilities in various contexts, improve both practical and theoretical knowledge of the target language, and ensure that students can freely apply their acquired knowledge, skills, and competencies in real-life activities. The task of the subject is to provide students with the necessary language skills, in accordance with internationally recognized standards, to achieve a B1 level of proficiency in the target foreign language through an integrated approach, and to develop their communicative competence. The objectives of the course based on this curriculum are as follows: • to develop students' ability to use English effectively for practical communication purposes; • to raise students' awareness of the nature of language and language learning skills; • to develop transferable skills that complement other areas of the curriculum; • to support students' personal development; During the course, the students will: • write and speak properly; • be able to use all language skills orally and verbally for effective professional communication and collaboration; • be able to competently express his speeches in Russian and foreign languages; • be able to read, interpret and analyze scientific data; • be able to learn and generalize the description of technologies, events, processes and give conclusions; • be able to read special texts, understand their content and translate them into their native languages; • knowledge of the English language as required; • using language to conduct monologues and dialogues on everyday topics; • be able to write informal letters, e-mails, reports, proposals and recommendations;
Content	1. Lesson 1. 4 hours (Lecture / Practical) • Reading comprehension & Vocabulary skills: Text: The Ice Hotel. Words and expression related to the text. • Grammar & writing & speaking skills: Grammar: Personal & Possessive pronouns. Be & have got. Writing: A family project. Words and expression related to family.

	Speaking: My family. ● Listening comprehension: Names & places 2. Lesson 2. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Food firsts. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Modal verb: <i>Can / can't</i>. Be & have got. Writing: Describing a celebrity. Words and expressions related to person's appearance, character and nationality. Speaking: My favorite actor (actress / singer / artist) ● Listening comprehension: Names & places 3. Lesson 3. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Hurricane who? Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: There is / are. Prepositions of place. Writing: <i>An advertisement for a sports center</i>. Words and expressions related to sports and activities. Speaking: <i>My favorite sports center</i>. ● Listening comprehension: Numbers. Cardinal & ordinal numbers 4. Lesson 4. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: How did those get in there? Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: The Present Simple tense. Adverbs of frequency. Prepositions of time. Writing: <i>Summer is great!</i> Words and expressions related to seasons, nature and weather. Speaking: <i>Spring (winter / autumn / summer) is my favorite season</i>. ● Listening comprehension: Numbers. Ordinal numbers. Percentage. 5. Lesson 5. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: A bug's sleep. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: The Present Continuous tense. Stative verbs. Words and expressions related to leisure and holidays. Writing: <i>A holiday postcard to a friend!</i> Speaking: <i>My day off (holiday)</i>. ● Listening comprehension: Numbers. Money. 6. Lesson 6. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Tiger's tale. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Imperatives. Singular and plural nouns. Uncountable nouns. How much & how many. Some & any.
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	Writing: A recipe of <i>Mediterranean Omelette!</i> Words and expressions related to meals and ways of cooking. Speaking: <i>My favorite dish!</i> ● Listening comprehension: Numbers. Time. Telephone. 7. Lesson 7. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Not the normal news. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Telling the time. The Present Simple tense for daily routines. Writing: <i>A daily routine of a person you know well or a famous person!</i> Words and expressions related to routines and lifestyle. Speaking: <i>My daily routine!</i> ● Listening comprehension: Numbers. Time. Clock 8. Lesson 8. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: The Wright way to fly. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Regular and irregular verbs. The Past Simple tense. Time connectors <i>first, then, later, after that, next, before, after, when</i>. Writing: <i>An event happened with Jasur!</i> Words and expressions related to past events & experiences. Speaking: <i>An event in my life!</i> ● Listening comprehension: Introduction & names. 9. Lesson 9. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Don't trust me. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Comparative & Superlative adjectives. Connectors <i>firstly, secondly, also, what is more; however, on the other hand; because, as</i>. Writing: <i>Cats Can make the Best Pets!</i> Words and expressions related to animals and their characters. Speaking: <i>My favorite pet!</i> ● Listening comprehension: Describing people. 10. Lesson 10. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Bugs for sale. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Modal verbs <i>should / shouldn't, must / mustn't</i>. Imperatives. Writing: a film review about the film <i>ET the Extra Terrestrial!</i> Words and expressions related to travelling. Speaking: <i>The film which I love very much!</i> ● Listening comprehension: Clothes. Lesson 11. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills:
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	Text: Mona who? Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Adjectives with <i>-ed</i> and <i>-ing</i>. The Present Simple tense for Reviews / Dramatic narrative. Connectors <i>and, because, so</i>. Writing: <i>a letter of advice to a friend!</i> Words and expressions related to movies and types of movies. Speaking: <i>Travelling abroad!</i> ● Listening comprehension: Routines. 12. Lesson 12. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Borrowed words. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Wh- questions. Adjectives & adverbs. Direct speech. Similes. Writing: <i>a story using the pictures!</i> Words and expressions related to past events and experiences. Speaking: <i>An interesting event which happened with me!</i> ● Listening comprehension: Dates. 13. Lesson 13. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Growing deserts. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: <i>Be going to</i> for plans & intentions. The Present Continuous tense for fixed arrangement for the future. Infinitive of purpose. Writing: <i>a letter to a friend about where you are going on your holiday!</i> Words and expressions related to holidays & holiday plans. Speaking: <i>My holiday plans!</i> ● Listening comprehension: Jobs. 14. Lesson 14. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Growing deserts. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: <i>Be going to</i> for plans & intentions. The Present Continuous tense for fixed arrangement for the future. Infinitive of purpose. Writing: <i>a letter to a friend about where you are going on your holiday!</i> Words and expressions related to holidays & holiday plans. Speaking: <i>My holiday plans!</i> ● Listening comprehension: Jobs. 15. Lesson 15. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Animals forecasters. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: The Future Simple tense with <i>will</i>. Writing: <i>a letter to a friend about where you are going on your holiday!</i> Words and expressions related to events which are predicted to happen in the future.
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	Speaking: <i>My holiday plans!</i> ● Listening comprehension: Sports & exercises.
Study and examination requirements and forms of examination	Oral Examination: For this exam, the student is given 20 minutes for preparation to answer the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are provided for all questions – 5 (Excellent) 2. If answers are provided for all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good) 3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not correspond to the questions – 2 (Unsatisfactory)
Media employed	The knowledge, qualifications and skills acquired by students in a foreign language are based on the priority tasks defined in the Resolution of the President of the Republic of Uzbekistan No. PQ-5117 dated May 19, 2021, “On measures to bring the activities of popularizing foreign language learning in the Republic of Uzbekistan to a qualitatively new level,” to raise students’ proficiency in a foreign language (English) to the B2 level. It also aims to develop the four core language skills - reading comprehension, listening comprehension, writing, and speaking - in an integrated manner, enhance communication abilities in various contexts, improve both practical and theoretical knowledge of the target language, and ensure that students can freely apply their acquired knowledge, skills, and competencies in real-life activities. The task of the subject is to provide students with the necessary language skills, in accordance with internationally recognized standards, to achieve a B1-B2 level of proficiency in the target foreign language through an integrated approach, and to develop their communicative competence. Based on the rating system for monitoring the level of knowledge, skills and qualifications of the student, the mastery of the subject by the student is presented in points. The progress of students in the subject during the semester is assessed from 1 to 5 grades, of which: Interval grading exam - grades 3-5 and Final grading exam - grades 3-5.
Reading list	1. Mirziyoyev Sh.M. Decree No. 4947 of PF-07.02.2017" on the strategy of Action for the further development of the Republic of Uzbekistan". 2. The Constitution of the Republic of Uzbekistan. Adopted by the national referendum of the Republic of Uzbekistan on April 30, 2023. 3. Casey Malarcher, Andrea Janzen. Reading Challenge (Book 1) Compass Publishing, 2015. 4. Li Ya Bin. Basic IELTS listening. Beijing Language and Culture University Press. Vietnam, 2010.

	5. Virginia Evans, Jenny Dooley. Reading and Writing Targets. (Basic / developing). Express publishing 2015. 6. Richards J. C., Grant Trew. Tactics for Listening. (Basic / developing) Oxford University Press, 2010 7. KEY ENGLISH TEST. Cambridge University Press. 2018. 8. PRELEMINARY ENGLISH TEST. Cambridge University Press. 2018 9. A. Azimov., Practical grammar: Tense and Voice. Karshi, Nasaf Publishing House, 2021
Reviewers	A. G. Alikulov – Associate Professor of the Interfaculty English Department, Candidate of Philological Sciences. Z. O. Amirova – Associate Professor of the Interfaculty English Department, Doctor of Philosophy in Philological Sciences (PhD).
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2025)
Module designation	UF1305, General physics
Semester(s) in which the module is taught	3
Person is responsible for the module	Allayorova Gulmira
Language	Uzbek language
Relation to curriculum	Compulsory subject
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 1 ECTS (150 hours): Lectures: 30 hours Practical training 30 hours Self-Study and Independent Learning: 90 hours
Credit points	Total Credits: 5 ECTS: 1
Required and recommended prerequisites for joining the module	Mathematical Analysis
Module objectives/intended learning outcomes	The subject “General Physics” introduces students to the main physical phenomena, their mechanisms, laws and practical applications. The subject of general physics forms in students a

	scientific and practical outlook, that is, the ability to correctly imagine the nature of physical phenomena, to relate the content of each specific task set in the field of natural sciences to the laws of general physics, and to use basic physical measuring instruments. The purpose of teaching the subject is to form basic concepts about the fundamental laws of classical and modern physics in students and to master them, to form skills in applying physical phenomena and laws in their professional activities, to develop scientific thinking and create a fundamental basis for the successful implementation of professional activities. At the same time, to form skills and qualifications to apply the acquired knowledge to non-standard problems in practice. The task of the subject is to form in students a scientific and practical worldview, that is, a correct understanding of the nature of physical phenomena, the ability to relate the content of each specific task set in the field of natural sciences to the general laws of physics, the ability to use basic physical measuring instruments, and pride in the contributions of Uzbek scientists to the development of physical science. It fulfills the tasks of having an idea of the foundations of physical knowledge and physical laws.
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Content	Topic 1. Physics and its functions. Mechanics Physics. The relationship of physics with mathematics and applied mathematics. Physical concepts. Methods of physical research. System of physical quantities and units. Departments of mechanics. Number system. Translational and rotational motion. Relationship between linear and angular quantities. Basic problems of dynamics. Inertial number system. Force. Moment of force. Impulse. Moment of impulse. Newton's laws. Basic equation of dynamics of translational and rotational motion. Law of conservation of impulse and momentum. Work. Power. Energy Topic 2. Mechanical vibrations and waves. Vibrations and waves. System of mechanical vibrations. Typology of vibrations. Harmonic vibrations. Free vibrations. Harmonic

	oscillator. Spring, mathematical and physical pendulum. Waves. Wave equation. Doppler effect for sound waves. Topic 3. Fluid and gas mechanics. Pressure. Pascal's law. Hydrostatic pressure. Archimedes' law. Description method in hydrodynamics. Continuity equation. Bernoulli's equation. Viscosity. Reynolds number. Similarity principle. Methods for determining viscosity (Stokes method, Poiseuille formula). Topic 4. Molecular-kinetic theory of gases. About molecular physics and thermodynamics. Molecular-kinetic theory of ideal gases. Equation of state of an ideal gas. Ideal gas laws. Mendeleev - Claiperson equation. Isoprocess graph. The main equation of the molecular kinetic theory of ideal gases. Average value of velocity and energy. Law of distribution of molecules by velocities and energies. Stern experiment. Barometric formula. Boltzmann distribution. Average running path of molecules. Intermolecular forces. Topic 5. Real gases Real gases. Van der Waals equation. Van der Waals isotherms. Internal energy of a Van der Waals gas. Joule-Thompson effect. Liquefaction of gases. Thermal conductivity. Fourier's law. Diffusion. Fick's law. Diffusion and osmosis. Internal friction. Newton's law. Viscosity. Molecular flow. Diffusion. Concept of vacuum. Topic 6. Concept of thermodynamics. Total and internal energy of a thermodynamic system. Work in thermodynamics. Degrees of freedom. First law of thermodynamics. Heat capacity. Isoprocesses. Adiabatic and polytropic process. Thermodynamic glass. Carnot glass. Heat engine. Second law of thermodynamics. Entropy Topic 7. Properties of solids. Basic properties of solids. Types of solids. Properties of amorphous solids. Specific properties of solids. Elasticity and brittleness. Topic 8. Electrostatics.
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	Electric charge. Coulomb's law. Electric field. Electric field strength. Principle of superposition of fields. Gauss's theorem. Work of electrostatic field forces. Potential. Capacitance. Capacitors. Electric field energy. Electric field in dielectrics. Dielectric absorption and polarization of dielectrics. Concept of piezoelectrics and ferroelectrics. Topic 9. Laws of constant current. Laws of constant electric current. Electrical resistance and methods of connecting them to a circuit. Work and power of constant current. Joule - Lenst law. Branched circuits, Kirchhoff's rules. Electric current in various media. Electrolysis. Faraday's laws. Temperature dependence of electrical conductivity in metals, semiconductors and electrolytes. Thermoelectric phenomena. Concept of superconductivity. Topic 10. Magnetic field and its characteristics. Properties of magnetic fields. Magnetic fields of currents. Magnetic properties of substances. Ampere's law. Biot-Savart-Laplace law. Magnetic fields of current-carrying conductors of various shapes. Lorentz force. Motion of charged particles in a uniform field. The phenomenon of electromagnetic induction. Faraday's law. Lenz's rule. Eddy current (Foucault current). Contour induction. Magnetic field energy. Mutual rotation of electric and magnetic fields. Eddy electric field. Topic 11. Wave properties of light. Electromagnetic wave equation. Scale of electromagnetic waves. Properties of electromagnetic waves. Electromagnetic wave energy. Umov-Poyting vector. Electromagnetic wave scale. Oscillation contour. Thomson's formula. Wave properties of light. Light interference. Light diffraction. Light polarization. Light dispersion. Normal and anomalous dispersion. Thermal and chemical effects of light. Anisotropy in deformations. Kerr effect. Pockels effect. Polarization Topic 12. Quantum theory of radiation.
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	Characteristics of thermal radiation. Absolute black body. Gray body. Kirchhoff's law. Stefan-Bolstmann law. Rayleigh-Jin's law. Wien's displacement law. Quantum theory of light. Planck's formulas. Photoelectric effect and its laws. Energy and momentum of photons. Origin of light. Lebedev's experiments. Compton effect. Photoluminescence, fluorescence and phosphorescence. Wave properties of matter. De Broglie's hypothesis. Heisenberg's uncertainty principle. Schrödinger equations and quantization. Topic 13. Mathematical apparatus of quantum mechanics. De Broglie's probability sign of a wave. Superposition principle. Uncertainty relations. Average values of the coordinate function and the momentum function. Linear and self-adjoint operators. Eigenvalues and eigenfunctions of operators. The concept of “quantization”. Average values of operators. Commutation of operators. Topic 14. Atomic structure and its properties. Atomic structure. Quantum mechanics of atoms and molecules. Quantum number. Bohr theory for the hydrogen atom. Spectra of hydrogen-like atoms. Energy levels. Bohr postulates. Frank and Gerst help. Concept of spin. Size of the atom. Atomic orbital and spin momenta. Large moment of the nucleus. Pauli principle. Mendeleev’s help periodic table. Topic 15. Nuclear structure and its properties. Nuclear composition. Mass and binding energy of the nucleus. The phenomenon of radioactivity. Nuclear reactions and conservation laws in them. Universe. Big bang
Examination forms	Paper examination
Study and examination requirements	Written Examination: In this exam, the student is given 80 minutes to write answers to the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are written for all questions – 5 (Excellent) 2. If answers are provided to all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good)

	3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not match the questions – 2 (Unsatisfactory)
Reading list	1. Tursunmetov K.A., Turgunboev F.Yu., Xamidjonov I.X. Umumiy fizika kursidan praktikum “Mexanika” o’quv qo’llanma T.-2019 y. 2. Tursunmetov K.A., Daliev X.S. Mexanika 1-qism. Toshkent. Universitet 2000 y. 3. Nazirov E.N. va boshqalar. Mexanika va molekulyar fizikadan praktikum. O’zbekiston, T.-2001 y. 4. Tursunmetov K.A. va boshqalar. Umumiy fizika kursidan praktikum. Mexanika. Universitet. T.-1998 y. 5. Landsberg G.S. “Optika” T.-1981. 6. Kaliteevskiy N.I. “Volnovaya optika” M. 1971. M. 2006. 7. Karimov R., Otajonov Sh., Eshjanov B., Buribaev L. Optikadan masalalar va laboratoriya ishlari to’plami. O’quv qo’llanma, Toshkent, 2012. 8. Polvonov S.R., Ruzimov Sh.M., Mamajusupova M.I. Atom va yadro fizikasidan laboratoriya ishlari. T. “UNIVERSITET”, 2020. - 120 b. 9. Kanokov Z., Karaxodjaev A.K., Nasriddinov K.R., Polvonov S.R. Atom va yadro fizikasidan laboratoriya ishlari. Universitet. T. - 2002. 10. Boyarkina A.N., Goncharov N.G. i dr. Praktikum po yadernoy fizike. M. : Izd-vo Moskovskogo un-ta, 1988. -199 s. 11. Polvonov S.R., Kanokov Z., Ruzimov Sh.M. Atom va yadro fizikasidan masalalar to’plami. T. “UNIVERSITET”, 2017. -200 b. Additional literature 1. Sh.M.Mirziyoyev. “Erkin va farovon, demokratik O’zbekiston davlatini birgalikda barpo etamiz”. Toshkent: “O’zbekiston”, 2016. -56 b. 2. Yangi tahrirdagi O’zbekiston Respublikasi Konstitutsiyasi. 2023 yil 1-may. № O’RQ - 837 3. Strelkov S.P. Mexanika – Toshkent, “O’qituvchi”, 1977. 4. Sivuxin D.P. Umumiy fizika kursi. 1-tom. Mexanika. Toshkent, “O’qituvchi”, 1981. 5. Kikoin A.K., Kikoin I.K. Umumiy fizika kursi. Molekulyar fizika. “O’qituvchi”, Toshkent 1978 y. 6. Sivuxin D.V. Umumiy fizika kursi. Termodinamika va molekulyar fizika. “O’qituvchi”, Toshkent-1984. 7. Sivuxin D.V. “Optika” “Fizmat” M. 2005. 8. Qo’lyiyev B.T. “Optika” “Fan va texnologiya” T. 2014. 9. Ahmadjonov O.I. Fizika kursi. Mexanika va molekulyar fizika. Toshkent, “O’qituvchi”, 1985. 10. Xaykin S.E. Fizicheskie osnovy mexaniki. M. “Nauka” 1971.

11. Zaydel I. Elementarnye otsenki oshibok izmereniy. M., 1959.
12. Reyf F. Statisticheskaya fizika. M., Nauka 1977, 1983.
13. Matveev A.N. Molekulyarnaya fizika. M. 1985.
14. Otajonov Sh., Eshchanov B.X. Optika. O'UM, O'zMU, 2015.
15. F.X. Tuxvatullin, A. Jumaboev, Sh.F. Fayzullaev, U.N. Tashkenbaev, G. Muradov. "Optika", O'quv qo'llanma, Samarqand, SamDU, 2004.
16. Otajonov Sh. "Molekulyar fizika" T. 1994.
17. Muminov T.M., Xoliqov A.B., Xolmurodov Sh.X. Atom yadrosi va zarralar fizikasi. T.: O'zbekiston faylasuflar jamiyati, 2009. - 288 b.
18. Teshaboev Q.T. Yadro va elementar zarralar fizikasi. T. 1992.
19. Muxin K.N. Eksperimentalnaya yadernaya fizika: Uchebnik. V 3-x tt. T.
20. Fizika atomnogo yadra. 7-ye izd., ster.- SPb.: Izd-vo "Lan". 2009. -384.
21. Xudson D. Statistika dlya fizikov. Per. S angl. M.: Mir, 1967. - 292 s.
22. Jukovskiy Yu.G., Sergeev V.O., Antoneva N.M. i dr. Praktikum po yadernoy fizike. M.: Vysshaya shkola, 1975. -197 s.

Information sources

1. Animatsion rolik (<http://www.upscale.utoronto.ca>. va <http://www.tical.ua.es>).
2. Fizika "Physicon".
3. Fizikadan o'quv kinofilmlari.
4. Ko'rgazmali rangli rasmlar (<http://www.hordWareandlysis.com>).
5. Physics online.
6. www.cultinfo/fulltext/1/008/077/561/html
7. www.en.edu.ru. Portal.
8. <https://physicon.ru>
9. <http://www.physics-online.ru>
10. <http://www.en.edu.ru/>
11. <http://cdfc.sinp.msu.ru> (MDU yadro ma'lumotlar markazi, Rossiya)
12. <http://www.inp.uz> (O'zFA Yadro fizikasi instituti)
13. <http://www.phys.msu.ru> (MDU fizika fakulteti sayti, Rossiya).

Module designation	MA 1123429 Mathematical analysis
Semester(s) in which the module is taught	1- Semesters (10 Credit), 2- Semesters (5 Credit), 3- Semesters (10 Credit) 4- Semesters (4 Credit)
Person is responsible for the module	<i>Baratov Bakhodir</i>
Language	<i>Uzbek language</i>
Relation to curriculum	<i>Compulsory (Core) Course</i>
Teaching methods	<i>Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.</i>
Workload (incl. contact hours, self-study hours)	<i>Workload for 1,2,3,4 ECTS (870 hours):</i> <i>Lectures: 210 hours</i> <i>Practical training 180 hours</i> <i>Self-Study and Independent Learning: 480 hours</i>
Credit points	<i>Total Credits: 29</i> <i>ECTS: 1-2-3-4</i>
Required and recommended prerequisites for joining the module	• <i>Elementary mathematics</i> • <i>Algebra</i> • <i>Geometry</i>
Module objectives/intended learning outcomes	<i>Upon successful completion of this module, students will be able to:</i> • <i>Solve both computational and theoretical problems in mathematical analysis, demonstrating a deep understanding of core concepts and techniques</i> • <i>Establish logical relationships between fundamental definitions, concepts, and theorems within mathematical analysis</i> • <i>Construct and present rigorous mathematical proofs for both classical results and newly formulated analogous statements</i> • <i>Apply a wide range of methods from mathematical analysis to investigate theoretical and applied problems</i> • <i>Select and combine appropriate analytical methods and techniques for solving complex mathematical tasks</i> • <i>Analyze and interpret abstract mathematical structures, ensuring logical consistency and mathematical rigor</i> <i>Demonstrate advanced skills in critical thinking, abstraction, and mathematical reasoning</i>
	2.
Content	1.1. Sets and operations on them.

	1.2. Reflections and their types. 1.3. Sequence of numbers and its limit. 1.4. The concept of a function. Elementary functions 1.5. Derivative of a function. Rules for calculating the derivative 1.6. Higher-order derivative and differential of a function. 1.7. Basic theorems 1.8. Taylor's formula 1.9. L'Hopital's rules 1.10. The concept of an elementary function and the indefinite integral 1.11. Properties of definite integrals. Calculation of definite integrals 1.12. Surface of a plane figure and its calculation. 1.13. Arc length and its calculation. 1.14. Imperfect integrals with infinite limits. 1.15. Imperfect integrals of an unbounded function.
Examination forms	Paper examination
Study and examination requirements	Students are required to: - Attend lectures and practical sessions regularly and actively participate in practical classes - Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving - Successfully complete all midterm assessment tasks - Achieve the minimum required score in continuous assessment to be admitted to the final examination - Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills
Reading list	- A.Sadullayev, H.Mansurov, G.Xudayberganov, A.Vorisov, R.G'ulomov, B.Abdullayevlarning "Matematik analiz kursidan misol va masalalar to'plami" Toshkent. 2025. - Demidovich B.P. Matematik tahlildan misol va masalalar to'plami: O'quv qo'llanma. Ruschadan tarjima - NamDU, 2019. - Kolmogorov A.N, Fomin S.V. Elementy teorii funktsiy i funktsionalnogo analiza. M. «Nauka», 1981. - Trenogin V.A., Pisarevskiy B.M., Soboleva T.S. Zadachi i uprajneniya po funktsionalnomu analizu. Iz-vo «Nauka». M. 1984. - Eshqobilov Yu.X. O'lchovli to'plamlar, - Toshkent, O'zMU, 2011.

Module designation	ChA11210 Linear Algebra
Semester(s) in which the module is taught	1-Semester
Person is responsible for the module	Muhayyo Jorayeva
Language	Uzbek language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 1 ECTS (300 hours): Lectures: 60 hours Practical training 60 hours Self-Study and Independent Learning: 180 hours
Credit points	10
Required and recommended prerequisites for joining the module	Mathematical analysis and Analytic Geometry
Module objectives/intended learning outcomes	The main goal of teaching linear algebra is to familiarize students with the necessary set of mathematical information (concepts, statements and their proofs, methods for solving practical problems, etc.). At the same time, it helps students think logically, draw correct conclusions, and improve their mathematical culture
Content	1. Gaussian method for solving systems of linear equations. Matrices and operations on them 2. Small-order determinants. Permutations and substitutions. 3. n-order determinants and their properties. 4. Laplace's theorem. Algebraic complements (cofactors) and minors. Laplace's theorem 5. Determinant and additional properties of matrices. Inverse matrix 6. Cramer and inverse matrix methods for solving systems of linear equations 7. n-dimensional vector space. Linear dependence. Basis of a vector space. 8. Matrix color. Kronecker-Capelli theorem. 9. System of homogeneous equations. Fundamental solution 10. Complex numbers and operations on them. Moivre's formula 11. Finding the n-th roots of a complex number. 12. Polynomials with one unknown. Gerner scheme. Bezu's theorem 13. Remainder. Enumeration of polynomials. Irreducible polynomials 14. Rational fractions and their expansion into simplest fractions 15. Root limits. Sturm's theorem 16. Linear spaces

	17. Euclidean space 18. Orthogonal complement 19. Linear, bilinear, and quadratic forms 20. Quadratic form 21. Law of inertia 22. Complex Euclidean spaces 23. Linear transformations 24. Inverse transformation 25. Invariant subspaces 26. Adjoint transformation 27. Unitary transformations 28. Commuting transformations 29. Jordan normal form of a linear transformation matrix
Examination forms	<i>Paper examination</i>
Study and examination requirements	It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and intermediate control, and submit a test or written work for final control.
Reading list	1. Ayupov A.SH., Omirov B.A, Xudoyberdiyev A.X, Gaydarov F.X., Algebra va sonlar nazariyasi, Toshkent, "Tafakkur bo'stoni", 2019 y. 2. P.H. Nazarov, B.T.Toshpulatov, A.D.Dusumbetov "Algebra va sonlar nazariyasi", I qism, Toshkent "Uqituvchi» nashriyoti, 1993 y. 3. Poskuryakov I.L. Sbornik zadach po lineynoy algebre."Nauka",2005. 4. Xojiev J.X., Faynleyb A.S. Algebra va sonlar nazariyasi kursi. Toshkent, "Uzbekiston", 2001 y. 5. Faddeev D.K., Sominskiy I.S. Zadachi po vysshey algebre, Sankt- Peterburg, 1999 g 6. Faddeev D.K. Leksii po algebre, M., "Nauka" 1984g. 7. Kostrikin A. I. i dr., Sbornik zadach po algebre. "Nauka", 1986g 8. Kenneth Kuttler. Elementary linear algebra. 2012, Ventus Publishing Aps, ISBN 978-87-403-0018-5.

Module designation	AG11207 Analytic geometry
Semester(s) in which the module is taught	1-semester, 2-semester
Person is responsible for the module	Ra'no Abdiraxmonova
Language	Uzbek language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 7 ECTS (210hours): Lectures: 44hours Practical training 46hours Self-Study and Independent Learning: 120hours
Credit points	7 (5+2)
Required and recommended prerequisites for joining the module	Mathematical Logic, Algebra, Mathematical Analysis, and Manifold theory.
Module objectives/intended learning outcomes	<i>The objective of the course “Analytic Geometry” is that it is one of the essential subjects for undergraduate students, providing them with the fundamental concepts and knowledge necessary for studying other specialized and professional disciplines. It also plays an important role in preparing undergraduate students to teach geometry in general secondary schools. Therefore, it is appropriate to teach this course to students majoring in Mathematics.</i>
Content	Topics included in the course: 1. Brief introduction to Analytic Geometry. Subject and methods of Analytic Geometry. Elementary problems of Analytic Geometry. 2. Concept of a Vector. Linear operations on vectors. 3. Linearly independent and linearly dependent families of vectors. Properties of linearly independent and linearly dependent vectors. Conditions for coplanarity of vectors. 4. Basis. Affine and Cartesian coordinate systems in space. Coordinates of a vector. Projection of a vector onto an axis. Magnitude and direction cosines of a vector. Scalar (dot) product of vectors. 5. Left-handed and right-handed systems. Vector (cross) product and scalar triple product of vectors. 6. Scalar, vector, and triple products of vectors given by coordinates. Change of Cartesian coordinate system in the plane and in space.

	7. Orientation. Polar, spherical, and cylindrical coordinate systems. 8. Equations of a plane and a straight line in space. Mutual positions of planes and lines. 9. Mutual positions of planes in space. Mutual positions of straight lines in space. 10. Distance from a point to a plane. Distance from a point to a straight line in space. 11. Distance between skew lines. 12. Second-order curves in the plane. Canonical equations of the ellipse and hyperbola. 13. Parabola and its canonical equation. Equations of the parabola, hyperbola, and ellipse in polar coordinates. 14. General equations of second-order curves. Center of a second-order curve. Central and non-central curves. 15. Mutual position of a second-order curve and a straight line. Asymptotic and non-asymptotic directions. 16. Center of a second-order curve. Central and non-central curves. Mutual position of a second-order curve and a straight line. 17. Tangent to a second-order curve, equation of conjugate diameters. Various directions. 18. Reduction of the general equation of a second-order curve to canonical form. 19. Canonical equations of second-order surfaces. Rectilinear generators of the one-sheeted hyperboloid and hyperbolic paraboloid. 20. General equation of a second-order surface. Center of a second-order surface. Second-order surface, tangent plane, and diametral plane. 21. Reduction of the general equation of a second-order surface to canonical form. 22. Isometric transformations. Motion.
Examination forms	Paper examination
Study and examination requirements	It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and intermediate control, and submit a test or written work for final control.
Reading list	1 Narmanov A.Ya. Analitik geometriya T.O'zbekiston Respublikasi faylasuflar milliy nashriyoti. 2008 y. 2 Modenov P.S. Analiticheskaya geometriya. M. Izd-vo MGU. 1969.

	3 <i>Baxvalov S.V., Modenov P.S., Parxomenko A.S. Analitik geometriyadan masalalar to'plami. T., Universitet, 2006 y.</i> 4 <i>Yangi tahrirdagi O'zbekiston respublikasi Konsitutsiyasi. 2023 yil 1-may. № O'RQ-837</i> 5 <i>Kletenik D.V. Sbornik zadach po analiticheskoy geometrii. M. «FIZMATLIT», 2016.</i> 6 <i>Izu Vaisman. Analytical Geometry. World Scientific, USA, 2007.</i>
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Module name:	Foreign language (English)
Code, if applicable:	INGT1104
Semesters in which the module is taught:	1
Lecturer:	Murodov Shuhrat, senior teacher
Language	Uzbek / English
Relation to curriculum:	Compulsory
Type of teaching, contact hours:	Lecture, practical
Workload:	120 hours Contact hours: 60 hours; lecture – 30 hours; practical – 30 hours Independent study: 60 hours
Credit points:	4
Recommended prerequisites:	English Lexicology English Grammar Practice of reading and writing

Module objectives Intended learning outcome	The module aims to develop the four core language skills - reading comprehension, listening comprehension, writing, and speaking - in an integrated manner, enhance communication abilities in various contexts, improve both practical and theoretical knowledge of the target language, and ensure that students can freely apply their acquired knowledge, skills, and competencies in real-life activities. The task of the subject is to provide students with the necessary language skills, in accordance with internationally recognized standards, to achieve a B1 level of proficiency in the target foreign language through an integrated approach, and to develop their communicative competence. The objectives of the course based on this curriculum are as follows: • to develop students' ability to use English effectively for practical communication purposes;
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	• to raise students' awareness of the nature of language and language learning skills; • to develop transferable skills that complement other areas of the curriculum; • to support students' personal development; During the course, the students will: • write and speak properly; • be able to use all language skills orally and verbally for effective professional communication and collaboration; • be able to competently express his speeches in Russian and foreign languages; • be able to read, interpret and analyze scientific data; • be able to learn and generalize the description of technologies, events, processes and give conclusions; • be able to read special texts, understand their content and translate them into their native languages; • knowledge of the English language as required; • using language to conduct monologues and dialogues on everyday topics; • be able to write informal letters, e-mails, reports, proposals and recommendations;
Content	1. Lesson 1. 4 hours (Lecture / Practical) • Reading comprehension & Vocabulary skills: Text: The Ice Hotel. Words and expression related to the text. • Grammar & writing & speaking skills: Grammar: Personal & Possessive pronouns. Be & have got. Writing: A family project. Words and expression related to family. Speaking: My family. • Listening comprehension: Names & places 2. Lesson 2. 4 hours (Lecture / Practical) • Reading comprehension & Vocabulary skills: Text: Food firsts. Words and expression related to the text. • Grammar & writing & speaking skills: Grammar: Modal verb: <i>Can / can't</i>. Be & have got. Writing: Describing a celebrity. Words and expressions related to person's appearance, character and nationality. Speaking: My favorite actor (actress / singer / artist) • Listening comprehension: Names & places 3. Lesson 3. 4 hours (Lecture / Practical) • Reading comprehension & Vocabulary skills: Text: Hurricane who? Words and expression related to the text. • Grammar & writing & speaking skills: Grammar: There is / are. Prepositions of place. Writing: <i>An advertisement for a sports center</i>. Words and expressions related to sports and activities. Speaking: <i>My favorite sports center</i>. • Listening comprehension: Numbers. Cardinal & ordinal numbers 4. Lesson 4. 4 hours (Lecture / Practical)

	● Reading comprehension & Vocabulary skills: Text: How did those get in there? Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: The Present Simple tense. Adverbs of frequency. Prepositions of time. Writing: <i>Summer is great!</i> Words and expressions related to seasons, nature and weather. Speaking: <i>Spring (winter / autumn / summer) is my favorite season.</i> ● Listening comprehension: Numbers. Ordinal numbers. Percentage. 5. Lesson 5. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: A bug's sleep. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: The Present Continuous tense. Stative verbs. Words and expressions related to leisure and holidays. Writing: <i>A holiday postcard to a friend!</i> Speaking: <i>My day off (holiday).</i> ● Listening comprehension: Numbers. Money. 6. Lesson 6. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Tiger's tale. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Imperatives. Singular and plural nouns. Uncountable nouns. How much & how many. Some & any. Writing: A recipe of <i>Mediterranean Omelette!</i> Words and expressions related to meals and ways of cooking. Speaking: <i>My favorite dish!</i> ● Listening comprehension: Numbers. Time. Telephone. 7. Lesson 7. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Not the normal news. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Telling the time. The Present Simple tense for daily routines. Writing: <i>A daily routine of a person you know well or a famous person!</i> Words and expressions related to routines and lifestyle. Speaking: <i>My daily routine!</i> ● Listening comprehension: Numbers. Time. Clock 8. Lesson 8. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: The Wright way to fly. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: Regular and irregular verbs. The Past Simple tense. Time connectors <i>first, then, later, after that, next, before, after, when.</i>
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	Writing: <i>An event happened with Jasur!</i> Words and expressions related to past events & experiences. Speaking: <i>An event in my life!</i> • Listening comprehension: Introduction & names. 9. Lesson 9. 4 hours (Lecture / Practical) • Reading comprehension & Vocabulary skills: Text: Don't trust me. Words and expression related to the text. • Grammar & writing & speaking skills: Grammar: Comparative & Superlative adjectives. Connectors <i>firstly, secondly, also, what is more; however, on the other hand; because, as.</i> Writing: <i>Cats Can make the Best Pets!</i> Words and expressions related to animals and their characters. Speaking: <i>My favorite pet!</i> • Listening comprehension: Describing people. 10. Lesson 10. 4 hours (Lecture / Practical) • Reading comprehension & Vocabulary skills: Text: Bugs for sale. Words and expression related to the text. • Grammar & writing & speaking skills: Grammar: Modal verbs <i>should / shouldn't, must / mustn't.</i> Imperatives. Writing: a film review about the film <i>ET the Extra Terrestrial!</i> Words and expressions related to travelling. Speaking: <i>The film which I love very much!</i> • Listening comprehension: Clothes. Lesson 11. 4 hours (Lecture / Practical) • Reading comprehension & Vocabulary skills: Text: Mona who? Words and expression related to the text. • Grammar & writing & speaking skills: Grammar: Adjectives with <i>-ed</i> and <i>-ing</i>. The Present Simple tense for Reviews / Dramatic narrative. Connectors <i>and, because, so.</i> Writing: <i>a letter of advice to a friend!</i> Words and expressions related to movies and types of movies. Speaking: <i>Travelling abroad!</i> • Listening comprehension: Routines. 12. Lesson 12. 4 hours (Lecture / Practical) • Reading comprehension & Vocabulary skills: Text: Borrowed words. Words and expression related to the text. • Grammar & writing & speaking skills: Grammar: Wh- questions. Adjectives & adverbs. Direct speech. Similes. Writing: <i>a story using the pictures!</i> Words and expressions related to past events and experiences. Speaking: <i>An interesting event which happened with me!</i> • Listening comprehension: Dates. 13. Lesson 13. 4 hours (Lecture / Practical) • Reading comprehension & Vocabulary skills: Text: Growing deserts. Words and expression related to the text.
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	● Grammar & writing & speaking skills: Grammar: <i>Be going to</i> for plans & intentions. The Present Continuous tense for fixed arrangement for the future. Infinitive of purpose. Writing: <i>a letter to a friend about where you are going on your holiday!</i> Words and expressions related to holidays & holiday plans. Speaking: <i>My holiday plans!</i> ● Listening comprehension: Jobs. 14. Lesson 14. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Growing deserts. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: <i>Be going to</i> for plans & intentions. The Present Continuous tense for fixed arrangement for the future. Infinitive of purpose. Writing: <i>a letter to a friend about where you are going on your holiday!</i> Words and expressions related to holidays & holiday plans. Speaking: <i>My holiday plans!</i> ● Listening comprehension: Jobs. 15. Lesson 15. 4 hours (Lecture / Practical) ● Reading comprehension & Vocabulary skills: Text: Animals forecasters. Words and expression related to the text. ● Grammar & writing & speaking skills: Grammar: The Future Simple tense with <i>will</i>. Writing: <i>a letter to a friend about where you are going on your holiday!</i> Words and expressions related to events which are predicted to happen in the future. Speaking: <i>My holiday plans!</i> ● Listening comprehension: Sports & exercises.
Study and examination requirements and forms of examination	Oral Examination: For this exam, the student is given 20 minutes for preparation to answer the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are provided for all questions – 5 (Excellent) 2. If answers are provided for all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good) 3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not correspond to the questions – 2 (Unsatisfactory)
Media employed	The knowledge, qualifications and skills acquired by students in a foreign language are based on the priority tasks defined in the Resolution of the President of the Republic of Uzbekistan No. PQ-5117 dated May 19, 2021, “On measures to bring the activities of popularizing foreign language learning in the Republic of Uzbekistan to a qualitatively new level,” to raise students’ proficiency in a foreign language (English) to the B2 level. It also aims to develop the four core language skills - reading comprehension, listening

	comprehension, writing, and speaking - in an integrated manner, enhance communication abilities in various contexts, improve both practical and theoretical knowledge of the target language, and ensure that students can freely apply their acquired knowledge, skills, and competencies in real-life activities. The task of the subject is to provide students with the necessary language skills, in accordance with internationally recognized standards, to achieve a B1-B2 level of proficiency in the target foreign language through an integrated approach, and to develop their communicative competence. Based on the rating system for monitoring the level of knowledge, skills and qualifications of the student, the mastery of the subject by the student is presented in points. The progress of students in the subject during the semester is assessed from 1 to 5 grades, of which: Interval grading exam - grades 3-5 and Final grading exam - grades 3-5.
Reading list	1. Mirziyoyev Sh.M. Decree No. 4947 of PF-07.02.2017" on the strategy of Action for the further development of the Republic of Uzbekistan". 2. The Constitution of the Republic of Uzbekistan. Adopted by the national referendum of the Republic of Uzbekistan on April 30, 2023. 3. Casey Malarcher, Andrea Janzen. Reading Challenge (Book 1) Compass Publishing, 2015. 4. Li Ya Bin. Basic IELTS listening. Beijing Language and Culture University Press. Vietnam, 2010. 5. Virginia Evans, Jenny Dooley. Reading and Writing Targets. (Basic / developing). Express publishing 2015. 6. Richards J. C., Grant Trew. Tactics for Listening. (Basic / developing) Oxford University Press, 2010 7. KEY ENGLISH TEST. Cambridge University Press. 2018. 8. PRELEMINARY ENGLISH TEST. Cambridge University Press. 2018 9. A. Azimov., Practical grammar: Tense and Voice. Karshi, Nasaf Publishing House, 2021
Reviewers	A. G. Alikulov – Associate Professor of the Interfaculty English Department, Candidate of Philological Sciences. Z. O. Amirova – Associate Professor of the Interfaculty English Department, Doctor of Philosophy in Philological Sciences (PhD).
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2025)
Module name:	Fundamentals of Programming
Code, if applicable:	DA12306
Semesters in which the module is taught:	2/3 - semesteri
Lecturer:	Bozorov Akmal, senior teacher
Language	Uzbek

Relation to curriculum:	Compulsory
Type of teaching, contact hours:	Lecture, practical
Workload:	210 hours - soati Contact hours: 90 hours; lecture – 30 hours; practical – 60 hours Self-study: 120 hours
Credit points:	7
Recommended prerequisites:	Computer literacy
Module objectives Intended learning outcome	The purpose of teaching the course is to provide undergraduate students of the “Mathematics” program with sufficient knowledge of programming fundamentals, to train them to implement software solutions for applied problems related to computer-based modeling based on this knowledge, and to form foundational competencies for mastering specialized subjects. The objective of the course is to develop practical skills in solving applied problems using high-level programming languages, and to build competencies in program development in C++ using object-oriented programming principles and generic programming techniques.
Content	II. Main Theoretical Part (Lecture Sessions) II.1. The course includes the following topics: Module 1 Topic 1. Introduction to the course “Fundamentals of Programming” C++ language syntax and its lexical basis. Structure and format of a C++ program. Data types. Fundamental types in C++. Variables and expressions. Operators: increment, decrement, sizeof, logical, bitwise, and comparison operators. Topic 2. Basics of Programming in C++ Input/output streams (cin, cout).

	Operators. Conditional statements. Loop statements. Control transfer statements. Solving transcendental equations using various methods. Topic 3. Arrays and Functions in Programming Static arrays. Sorting arrays; computing average, maximum, and minimum values; scalar product; matrix–vector and matrix–matrix multiplication. Declaring and defining functions. Local and global variables. Recursive functions. Standard library functions. Pointers and address variables. Dynamic arrays. Functions and arrays. Topic 4. Mathematical Functions Library (math.h) Transcendental functions, solving systems of equations, differential and integral calculation functions. Module 2. Working with Structures and Functions in Programming Topic 5. Working with Structures in Programming Strings and operations on strings. Structures and unions. Dynamic structures. Topic 6. Working with Files in Programming Concept of a file. Text and binary files. File and string streams. File input/output functions. File pointer control functions.
Study and examination requirements and forms of examination	Written Examination: In this exam, the student is given 80 minutes to write answers to the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are written for all questions – 5 (Excellent) 2. If answers are provided to all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good) 3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not match the questions – 2 (Unsatisfactory)

Media employed	Completion of science assignments and successful submission of current, intermediate, and final control forms.
Reading list	Main literature. 1. Zhogolev, E. A. Tekhnologiya programmirovaniya [Programming Technology] - M.: Nauchnyy mir, 2004. - 216 p. 2. Smirnov, A. A. Tekhnologii programmirovaniya: uchebno-prakticheskoe posobie [Programming Technologies: An Educational and Practical Manual] / A. A. Smirnov. - M.: Evraziyskiy otkrytyy institut, 2011. - 192 p. 3. Kamaev, V. A. Tekhnologii programmirovaniya [Programming Technologies] / V. A. Kamaev, V. V. Kosterin. - M.: Vysshaya shkola, 2005. - 359 p. 4. Rudakov, A. V. Tekhnologiya razrabotki programmnykh produktov: uchebnik [Technology of Software Product Development: A Textbook] / A. V. Rudakov. - 6th ed., stereotype.- M.: Akademiya, 2011. - 208 p. 5. Svetlov, N. M. Informatsionnye tekhnologii upravleniya proektami: uchebnoe posobie [Information Technologies for Project Management: A Textbook] / N. M. Svetlov, G. N. Svetlova. - 2nd ed., rev. and add. - M.: INFRA-M, 2011. - 232 p. 6. Gnidenko, I. G. Tekhnologii i metody programmirovaniya: uchebnoe posobie dlya studentov vysshikh uchebnykh zavedeniy, obuchayushchikhsya po inzhenerno-tekhnicheskim napravleniyam [Programming Technologies and Methods: A Textbook for Students of Higher Educational Institutions in Engineering and Technical Fields] / I. G. Gnidenko, F. F. Pavlov, D. Yu. Fedorov; [Saint Petersburg State University of Economics]. - Moscow: Yurayt, 2021. - 233, [2] p. 7. Fedotova, E. L. Informatsionnye tekhnologii i sistemy: uchebnoe posobie dlya studentov vysshikh uchebnykh zavedeniy, obuchayushchikhsya po napravleniyu podgotovki 09.03.03 "Prikladnaya informatika" [Information Technologies and Systems: A Textbook for Students of Higher Educational Institutions in the Field of Study 09.03.03 "Applied Informatics"] / E. L. Fedotova. - M.: FORUM: INFRA-M, 2021. - 351 p. Supplementary literature 1. Gvozdeva, T. V. Proektirovanie informatsionnykh sistem: uchebnoe posobie [Information Systems Design: A Textbook] / T. V. Gvozdeva, B. A. Ballod. - Rostov-n/D: Feniks, 2009. - 508 p.

	2. Ivanova, G. S. Tekhnologiya programmirovaniya: Uchebnik [Programming Technology: A Textbook] / G. S. Ivanova. - M.: KnoRus, 2011. - 336 p. 3. Kotlyarov, V.P. Fundamentals of Software Testing: Textbook / V.P. Kotlyarov. - M.: Internet-University of Information Technologies, 2009 - 285p. 4. Soldatov, V.P. Management of Software Projects / V.P. Soldatov. - M.: BINOM, 2010 - 384p. Electronic resources: 1. http://mycsharp.ru/ 2. https://docs.microsoft.com 3. http://ci-sharp.ru/ 4. http://nullpro.info/ 5. https://metanit.com/
Reviewers	Z. M. Kurbanov – Associate Professor of the “Applied Mathematics” Department, Qarshi State University. E. A. Eshboyev – Associate Professor of the “Applied Mathematics” Department, Qarshi State University.
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2025)

Module name:	Use of the Uzbek language in the field
Code, if applicable:	OTS1202
Semesters in which the module is taught:	2
Lecturer:	Dilmurod Yuldoshev, Senior teacher
Language	Uzbek
Relation to curriculum:	Compulsory
Type of teaching, contact hours:	practical
Workload:	60 hours Contact hours: practical – 30 hours Self-study: 30 hours
Credit points:	2
Recommended prerequisites:	"Uzbek language", "Fundamentals of business in the state language", "Speech culture", "Teacher's speech culture", "Practical grammar of the Uzbek language"

Module objectives	The purpose of teaching the subject is to consolidate and further expand the knowledge and skills acquired by students in the Uzbek
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Intended learning outcome	language, to help them master the state language within the framework of their chosen specialty, to enrich their speech with professional terms, to ensure a high level of verbal literacy in the Uzbek language. Also, the aim is to form the ability of students to apply the knowledge and skills acquired in the subject in the process of communication and work, based on the communicative speech principle, so that they can work in everyday, scientific and professional spheres. The task of the subject is to improve the skills of independent speaking and writing in the Uzbek language on speech topics necessary for daily work and life, to form the skills of composing and modifying texts in various speech styles related to the specialty, to develop speech competence, to form the skills of effectively using professional terms in oral and written speech, to form the skills of composing, editing and analyzing professional texts, to form the skills of compiling professional documents, including filling out and formalizing electronic documents, to teach understanding information in the Uzbek language, and to express a critical and analytical attitude to it.
Content	1. Lesson 1. 2 hours (Practical) The purpose and objectives of the field-oriented teaching of the Uzbek language The fact that the Uzbek language is the State language of the Republic of Uzbekistan. The scientific, historical and social significance of the Law "On the State Language". Memorizing the "Hymn of Uzbekistan". Preparing a text on the topic "Uzbekistan is a single homeland!". Performing exercises and assignments. 2. Lesson 2. 2 hours (Practical) Expansion of the social functions of the Uzbek language: changes in society and language development Phonetics is a branch of linguistics that studies speech sounds. Vowels and consonants. Their writing and pronunciation. Preparation of a text on the topic "Uzbek language - the state language". Exercises and tasks. 3. Lesson 3. 2 hours (Practical) Norms of the Uzbek literary language Phonetic, lexical-semantic norm. Orthographic, orthoepic norm, morphological and syntactic norms. Norms of word formation. Preparation of a text on the topic "National values - pride of the nation". Performing exercises and tasks on the topic. 4. Lesson 4. 2 hours (Practical) Spelling rules of the Uzbek-Latin alphabet. Punctuation marks in the Uzbek language. Spelling of bases and suffixes. Adding and separating. Spelling of Bish letters. Rules for transferring. Use of punctuation marks. Conversation and preparation of a text on "Our history and our time". Exercises and tasks on the topic.

	5. Lesson 5. 2 hours (Practical) Speech styles and their characteristics. Artistic style and its characteristics. Publicistic style and its characteristics. Oral-written style and its characteristics. Prepare a conversation and text on the topic “Book is our best friend”. Complete exercises and assignments on the topic. 6. Lesson 6. 2 hours (Practical) Scientific method. Lexical characteristics of specialized terms. Their use. Selection and study of specialized terms in the text. Homonyms, synonyms and antonyms in the Uzbek language. Types of words according to the relationship of form and meaning. Homonyms, synonyms and antonyms, synonymic series. Features of the use of specialized terms. Dictionaries. Types of dictionaries. Encyclopedic and linguistic dictionaries. Preparing a text on the topic "Education in the modern world". Performing exercises and tasks on the topic. Preparing a text on the topic "The future is in the hands of educated youth". Performing exercises and tasks on the topic. 7. Lesson 7. 2 hours (Practical) Communicative qualities of expert speech. Professional speech. Scientificity, accuracy, precision, purity of expert speech. Preparation of a conversation and text on the topic "Innovations in the 21st century". Performing exercises and tasks on the topic. 8. Lesson 8. 2 hours (Practical) Presentation speech on the subject. Rules for creating a presentation on the subject. Translation of articles from newspapers. Preparation of a conversation and text on the topic “Global problems of our time”. Performing exercises and tasks on the topic. 9. Lesson 9. 2 hours (Practical) Language and style of business. Types of documents and their specific features. Necessary parts of the document and their execution. 10. Lesson 10. 2 hours (Practical) Issues of conducting business in the state language in the field. Organizational documents. Lesson 11. 2 hours (Practical) Features of sectoral regulatory documents. Types of regulatory documents. Conversation on the topic "Legal culture". Exercises and tasks on the topic 12. Lesson 12. 4 hours (Lecture / Practical) Professional information documents. Types of information documents. Types of stylistically specific vocabulary. 1) written speech vocabulary, 2) oral speech vocabulary. Preparation of a conversation and text on the topic "Higher education in Uzbekistan". Performing exercises and assignments on the topic. 13. Lesson 13. 2 hours (Practical) Professional service correspondence. Types of service correspondence. Preparation of a conversation and text on the topic “From the life of our scientific institution”. Performing exercises and assignments on the topic.
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	14. Lesson 14. 2 hours (Practical) Documents related to employee activities and their execution in the state language. Work book, collection of personal documents. 15. Lesson 15. 2 hours (Practical) Procedure for working with documents. Registration of documents. Control over the execution of documents. Systematization of documents, Formation of a collection folder of documents. Preparation and execution of outgoing and internal documents
Study and examination requirements and forms of examination	Final control. The student must answer 5 questions in writing or 50 test questions. - 10 points are awarded for each written question. - 10-9 points if the essence of the question is fully revealed, the student has a creative approach to the topic, and a critical point of view is expressed. - 8-7 points if the essence of the question is revealed, the main facts are stated. - 6-5 points if the question is answered, but there are some shortcomings. - 4-1 point is awarded if the answers to the given question are very shallow and have many shortcomings. - 0 points are awarded for not answering the questions. - 1 point is awarded for each correct answer to the 50 test questions.
Media employed	Modern information and pedagogical technologies in teaching science: The following approaches are used in the design of science: Personally oriented education. This education, by its very nature, provides for the full development of all participants in the educational process. This implies, of course, when designing education, not the personality of a particular learner, but, first of all, an approach based on the goals of learning related to future professional activity. Systemic approach. Educational technology should embody all the features of a system: the logic of the process, the interconnection of all its links, and its integrity. Activity-oriented approach. Represents education aimed at the formation of the process qualities of a person, the activation and intensification of the learner's activity, the disclosure of all his abilities and capabilities, and initiative in the educational process. Dialogical approach. This approach implies the need to create psychological unity and mutual relations of the participants in the educational process. As a result, the creative activity of the individual, such as self-activation and self-expression, is enhanced.

	Organization of cooperative education. It implies the need to focus on democracy, equality, cooperation in subjective relations between the educator and the learner, the introduction of joint work in the formation of goals and content of activities and the assessment of achieved results. Problem-based education. One of the methods of activating the activity of the learner by presenting the content of education in a problematic way. This ensures the formation and development of objective contradictions of scientific knowledge and methods of its resolution, dialectical observation, and their creative application in practical activities. In teaching science, information (presentation, multimedia technologies) and modern educational technologies (developmental educational technologies, technologies aimed at the full mastery of science), interactive methods ("T-chart", "BBB", "Concept analysis", "Brainstorming", "Cluster", "Zigzag", "Let's study together", FSMU, etc.) and "Case study" technology are used. In addition, the use of textbooks, study guides, and handouts is envisaged.
Reading list	1. Aminov M., Madvaliyev A., Mahkamov N. Mahmudov N., Odilov Y. Conducting business in the state language (practical manual). – Tashkent: Uzbekistan, 2021. –527 p. 2. Mahmudov N., Rafiev., Yuldoshev I. Speech culture and conducting business in the state language. (Textbook) – Tashkent: Cholpon, 2013. 3. Lutfullayeva D. The development of official and departmental work methods during the independence period. (Monograph.) – Tashkent, 2020. 4. Decree of the President of the Republic of Uzbekistan dated October 21, 2019 No. PF-5850 “On measures to radically increase the prestige and status of the Uzbek language as the state language” (National database of legal documents, 21.10.2019, issue 06/19/5712/3034) https://lex.uz/docs/4561730 5. Explanatory dictionary of the Uzbek language.
Reviewers	Y.Ne'matova – Associate Professor of the Department of Uzbek Language and Literature D. Shodmonova – Associate Professor of the Department of Uzbek Language and Literature
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2023)

Module designation	EGP1202 Elementary Geometry Practicum
Semester(s) in which the module is taught	2-Semester
Person is responsible for the module	<i>Oybek Xurramov</i>
Language	<i>Uzbek language</i>
Relation to curriculum	Compulsory
Teaching methods	<i>Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.</i>
Workload (incl. contact hours, self-study hours)	60 hours – this is 2 ECTS credits: <i>Practical training 30 hours</i> <i>Self-Study and Independent Learning: 30 hours</i>
Credit points	2
Required and recommended prerequisites for joining the module	Mathematics (school course), Elementary Algebra, Elementary Geometry (basics of plane geometry and solid geometry), Fundamentals of Trigonometry, Basics of Mathematical Logic, Analytic Geometry (introductory concepts), Linear Algebra (introductory level)
Module objectives/intended learning outcomes	It consists of developing the skills and methods to visualize geometric objects clearly and to apply the necessary formulas through studying problems in elementary geometry. This knowledge is widely applied in modern branches of differential geometry and topology—such as the theory of manifolds, differential topology, homotopy, and homology—as well as in the education system.
Content	1. Similar triangles 2. Inscribed angle 3. Circles 4. Area 5. Triangles 6. Polygons 7. Locus of points 8. Geometric constructions 9. Volume 10. Sphere 11. Tetrahedron 12. Pyramid and prism 13. Locus of points and constructions 14. Vectors 15. Geometric transformations
Examination forms	<i>Paper examination</i>
Study and examination requirements	Theoretical Knowledge: 1. Understanding the basic concepts of elementary geometry, definitions, and the essence of theorems. 2. Memorizing formulas and methods correctly and being able to apply them. Practical Skills:

	1.Independently solving given geometric problems. 2.Accurately drawing geometric figures and analyzing their properties. 3.Choosing and applying different methods when solving problems. Analytical and Logical Thinking: 1.Being able to construct a logical sequence for solving problems. 2.Analyzing problems and justifying the results. Exam Format: 1.Solving test questions and short written problems. 2.Providing precise answers to theoretical questions and illustrating with examples.
Reading list	1. Argunov B.I., Demidova I.N. Litvinenko V.N. Zadachnik-practicum po geometry. Moscow "Prosveshchenie" 1979. Chast I, II. (in Russian) 2. Delone B., Zhitomersky O. Zadachnik po geometry. M. Leningrad. 1949. (in Russian) 3. Zelenyak O.P. Reshenie zadach po geometrii. Moscow-St. Petersburg-Kiev. 2008. 4. Ivanov O.A. Praktikum po elementary mathematics. Algebroanalyticheskie metody. MTsNMO. 2001. 5. Ponarin Ya.P. Elementary geometry. Planimetry, preobrazovaniya ploskosti. Tom 1. M. MTsNMO. 2004 6. Ponarin Ya.P. Elementary geometry. Stereometry, preobrazovaniya prostanstva. Tom 2. M. MTsNMO. 2006 7. Ponarin Ya.P. Elementary geometry. Treugol's, tetrahedron. Tom 3. M. MTsNMO. 2009 8. Prasolov V.V. Planimetry of Zadachi. M. MTsNMO. 2006 9. Prasolov V.V. Stereometry of Zadachi. M. MTsNMO. 2016 10. Polonsky V.B., Rabinovich E.M., Yakir M.S. Uchimsya reshat zadachi po geometry. Kiev "Magistr-S" 1996.

Module name:	Physical education and sports
Code, if applicable:	JTS1202
Semesters in which the module is taught:	2
Lecturer:	Akbarov Sherzod Axrorovich
Language	Uzbek
Relation to curriculum:	Compulsory
Type of teaching, contact hours:	Practical
Workload:	60 hours Contact hours: 30 hours;

	Self-study: 30 hours
Credit points:	2
Recommended prerequisites:	Sports: volleyball, handball, football, gymnastics

Module objectives Intended learning outcome	The purpose of teaching a subject - the purpose of physical education of students is to form the physical culture of the individual, which in turn ensures the individual's readiness for social and professional activities, adherence to a healthy lifestyle, and the desire to regularly achieve physical fitness. The tasks of teaching a subject - to achieve the above goals, the following educational, educational, developmental and health-improving issues are envisaged: Understanding the role of physical culture in the formation of a person and preparing him for professional activity; Knowledge of the scientific and practical foundations of physical culture and a healthy lifestyle; Formation of a valuable attitude to physical culture, a healthy lifestyle, the desire for physical fitness, and the need to regularly engage in self-education and physical exercises;
Content	Practical lesson 1 Introduction. Determining the physical fitness of students. Teaching the technique of jumping from a standing position to a long jump. Practical lesson 2 Gymnastics. Row exercises. Row preparation. Turns in place and while moving. Movements in different directions. Re-lineups in place and while walking. Teaching the technique of passing and receiving the ball at short distances in a football game. Practical lesson 3 Gymnastics. Row exercises. Spreading and squeezing: with additional steps, with turns from the middle, with separations from the line according to height and circular turns. Rules of the football game. Two-way educational game. Practical lesson 4 Gymnastics. Row exercises. Spreading and squeezing: with additional steps, with turns from the middle, with separations from the line according to height and or improving circular turns. Rules of the football game. Two-way educational game. Practical lesson 5 Athletics. Running for short distances. Exercises for developing physical qualities (speed). Teaching the technique of running for 60-100 meters. Rules of the football game. Two-way educational game. Practical lesson 6 Athletics. Teaching the technique of running for short distances Running for 400 meters. Action games related to the football game. Two-way educational game Practical lesson 7 Athletics. Improving the technique of running for medium distances. Running for 500-1000 meters. Teaching national action games with relays.

	Practical lesson 8 Athletics. Improving the technique of running for long distances. Running for 3000-5000 meters. Teaching the elements of sports games through national and action games. Practical lesson 9 Volleyball game rules. Teaching volleyball players the initial, static, variable and basic, high and low stances. Teaching national movement games suitable for the sport of volleyball. Practical lesson 10 Volleyball game technique. Teaching the technique of putting the ball into the game from above. Two-way training game. Practical lesson 11 Volleyball game technique. Teaching the technique of passing the ball accurately from above with two hands. Two-way training game. Practical lesson 12 Volleyball game tactics. Teaching the tactics of one-man blocking and moving in defense. Two-way training game. Practical lesson 13 Basketball game. Improving ball carrying. Two-way training game. Practical lesson 14 Basketball game. Improving throwing the ball into the hoop from medium and close distances. Two-way training game. Practical lesson 15 Basketball game. Teaching how to catch a ball that has bounced from a shot. Two-way training game. Practical lesson 16 Rules of the handball game. Teaching the technique of catching, passing, hitting and carrying the ball. Two-way training game. Practical lesson 17 Handball. Attacking technique. Improving the technique of catching, passing, hitting and carrying the ball. Two-way training game. Practical lesson 18 Handball. Attacking technique. Sending the ball to the goal in various situations. Two-way training game. Practical lesson 19 Handball. Defensive technique. Improving the technique of catching, hitting, blocking the ball. Two-way training game. Practical lesson 20 Rules of the game of football. Teaching the technique of passing and receiving the ball at a short distance in a football game. Practical lesson 21 Improving the technique of passing and receiving the ball at a short distance in a football game. Two-way training game. Practical lesson 22 Teaching the technique of kicking the ball into the goal from a close distance in a football game. Two-way training game. Practical lesson 23 Improving the technique of kicking the ball into the goal from a medium and close distance in a football game. Two-way training game. Practical lesson 24 Rules of the game of badminton. Teaching the technique of putting the shuttlecock into the game and returning it in a badminton game. Practical lesson 25 Teaching the technique of returning the shuttlecock and stepping in defense in badminton. Practical lesson 26 Rules of the game of table tennis. Teaching the technique of hitting the ball.
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	Practical lesson 27 Rules of the game of table tennis. Improving the technique of stepping in attack and defense. Practical lesson 28 National movement games. Teaching movement games that develop speed. Practical lesson 29 National movement games. Teaching movement games that develop endurance. Practical lesson 30 National movement games. Teaching movement games that develop strength.
Study and examination requirements and forms of examination	№ Indicators points Maximum score Qualifying score 1 The questions of the Final Control Work in the subject are compiled on the basis of practical exercises and independent study topics in a ratio of 50/50. 50 30 2 practical methods (general and special physical training) (25x2)=50 30 2 *for each question in the written or oral version (5x10)=50 30 for each test task in the test version (2x25)=50 30 TOTAL: 50 points
Media employed	-
Reading list	1. A.N.Normurodov. "Jismoniy tarbiya" O'quv qo'llanma. Toshkent-bo'stoni, 2016 yil. 2. T.S.Usmanxodjayev "Milliy va harakatli o'yinlar" Darslik Toshkent 2015-yil 3. Xurramov Jasur Qo'ziliyevich Sport o'yinlarni o'qitish metodikasi (Basketbol) Darslik. Qarshi 2022 yil. 4. Nuraliyeva O'giloy Shomuratovna "Jismoniy tarbiya va sport" O'quv qo'llanma. Qarshi 2022 yil. 5. A.T.Jabborov Sport harakatli o'yinlar o'qitish metodikasi (Stol tennis) O'quv qo'llanma. Qarshi 2021 yil. 6. F.R.Eshpo'latov Gimnastika va uni o'qitish metodikasi darsi. O'quv qo'llanma. Qarshi 2021 yil. 7. E.O.Davronov. Qo'l to'pi . O'quv qo'llanma. Qarshi 2021 yil.

	8.Yomg'irov G'affor Bobosherovich Sport va xarakatli o'yinlar va uni o'qitish metodikasi (Voleybol) Qarshi.2023-yil 9. Akbarov Sherzod Axrorovich "Jismoniy tarbiya va sport" O'quv qo'llanma. Qarshi 2024 yil.
Reviewers	Jabborov A. Jismoniy tarbiya va sport kafedrasi, dots. Xudoyberdiyev B. Sport faoliyati kafedirasi dots, PhD.
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2025)

Module designation	UF1305, General physics
Semester(s) in which the module is taught	3
Person is responsible for the module	<i>Allayorova Gulmira</i>
Language	<i>Uzbek language</i>
Relation to curriculum	<i>Compulsory subject</i>
Teaching methods	<i>Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.</i>
Workload (incl. contact hours, self-study hours)	<i>Workload for 1 ECTS (150 hours):</i> <i>Lectures: 30 hours</i> <i>Practical training 30 hours</i> <i>Self-Study and Independent Learning: 90 hours</i>
Credit points	<i>Total Credits: 5</i> <i>ECTS: 1</i>
Required and recommended prerequisites for joining the module	• <i>Mathematical Analysis</i>
Module objectives/intended learning outcomes	The subject “General Physics” introduces students to the main physical phenomena, their mechanisms, laws and practical applications. The subject of general physics forms in students a scientific and practical outlook, that is, the ability to correctly imagine the nature of physical phenomena, to relate the content of each specific task set in the field of natural sciences to the laws of general physics, and to use basic physical measuring instruments. The purpose of teaching the subject is to form basic concepts about the fundamental laws of classical and modern physics in students and to master them, to form skills in applying physical phenomena and laws in their professional activities, to develop scientific thinking and create a fundamental basis for the successful implementation of professional activities. At the same time, to form skills and qualifications to apply the acquired knowledge to non-standard problems in practice. The task of the subject is to form in students a scientific and practical worldview, that is, a correct understanding of the nature of physical phenomena, the ability to relate the content of each specific task set in the field of natural sciences to the general laws of physics, the ability to use basic physical measuring instruments, and pride in the contributions of Uzbek scientists to the development of physical science. It fulfills the tasks of having an idea of the foundations of physical knowledge and physical laws.
	3.
Content	Topic 1. Physics and its functions. Mechanics Physics. The relationship of physics with mathematics and applied mathematics. Physical concepts. Methods of

	physical research. System of physical quantities and units. Departments of mechanics. Number system. Translational and rotational motion. Relationship between linear and angular quantities. Basic problems of dynamics. Inertial number system. Force. Moment of force. Impulse. Moment of impulse. Newton's laws. Basic equation of dynamics of translational and rotational motion. Law of conservation of impulse and momentum. Work. Power. Energy Topic 2. Mechanical vibrations and waves. Vibrations and waves. System of mechanical vibrations. Typology of vibrations. Harmonic vibrations. Free vibrations. Harmonic oscillator. Spring, mathematical and physical pendulum. Waves. Wave equation. Doppler effect for sound waves. Topic 3. Fluid and gas mechanics. Pressure. Pascal's law. Hydrostatic pressure. Archimedes' law. Description method in hydrodynamics. Continuity equation. Bernoulli's equation. Viscosity. Reynolds number. Similarity principle. Methods for determining viscosity (Stokes method, Poiseuille formula). Topic 4. Molecular-kinetic theory of gases. About molecular physics and thermodynamics. Molecular-kinetic theory of ideal gases. Equation of state of an ideal gas. Ideal gas laws. Mendeleev - Clapeyron equation. Isoprocess graph. The main equation of the molecular kinetic theory of ideal gases. Average value of velocity and energy. Law of distribution of molecules by velocities and energies. Stern experiment. Barometric formula. Boltzmann distribution. Average running path of molecules. Intermolecular forces. Topic 5. Real gases Real gases. Van der Waals equation. Van der Waals isotherms. Internal energy of a Van der Waals gas. Joule-Thompson effect. Liquefaction of gases. Thermal conductivity. Fourier's law. Diffusion. Fick's law. Diffusion and osmosis. Internal friction. Newton's law. Viscosity. Molecular flow. Diffusion. Concept of vacuum. Topic 6. Concept of thermodynamics. Total and internal energy of a thermodynamic system. Work in thermodynamics. Degrees of freedom. First law of thermodynamics. Heat capacity. Isoprocesses. Adiabatic and polytropic process. Thermodynamic glass.
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	Carnot glass. Heat engine. Second law of thermodynamics. Entropy Topic 7. Properties of solids. Basic properties of solids. Types of solids. Properties of amorphous solids. Specific properties of solids. Elasticity and brittleness. Topic 8. Electrostatics. Electric charge. Coulomb's law. Electric field. Electric field strength. Principle of superposition of fields. Gauss's theorem. Work of electrostatic field forces. Potential. Capacitance. Capacitors. Electric field energy. Electric field in dielectrics. Dielectric absorption and polarization of dielectrics. Concept of piezoelectrics and ferroelectrics. Topic 9. Laws of constant current. Laws of constant electric current. Electrical resistance and methods of connecting them to a circuit. Work and power of constant current. Joule - Lenst law. Branched circuits, Kirchhoff's rules. Electric current in various media. Electrolysis. Faraday's laws. Temperature dependence of electrical conductivity in metals, semiconductors and electrolytes. Thermoelectric phenomena. Concept of superconductivity. Topic 10. Magnetic field and its characteristics. Properties of magnetic fields. Magnetic fields of currents. Magnetic properties of substances. Ampere's law. Biot-Savart-Laplace law. Magnetic fields of current-carrying conductors of various shapes. Lorentz force. Motion of charged particles in a uniform field. The phenomenon of electromagnetic induction. Faraday's law. Lenz's rule. Eddy current (Foucault current). Contour induction. Magnetic field energy. Mutual rotation of electric and magnetic fields. Eddy electric field. Topic 11. Wave properties of light. Electromagnetic wave equation. Scale of electromagnetic waves. Properties of electromagnetic waves. Electromagnetic wave energy. Umov-Poyting vector. Electromagnetic wave scale. Oscillation contour. Thomson's formula. Wave properties of light. Light interference. Light diffraction. Light polarization. Light dispersion. Normal and anomalous dispersion. Thermal and chemical effects of light. Anisotropy in deformations. Kerr effect. Pockels effect. Polarization Topic 12. Quantum theory of radiation.
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	Characteristics of thermal radiation. Absolute black body. Gray body. Kirchhoff's law. Stefan-Boltzmann law. Rayleigh-Jin's law. Wien's displacement law. Quantum theory of light. Planck's formulas. Photoelectric effect and its laws. Energy and momentum of photons. Origin of light. Lebedev's experiments. Compton effect. Photoluminescence, fluorescence and phosphorescence. Wave properties of matter. De Broglie's hypothesis. Heisenberg's uncertainty principle. Schrödinger equations and quantization. Topic 13. Mathematical apparatus of quantum mechanics. De Broglie's probability sign of a wave. Superposition principle. Uncertainty relations. Average values of the coordinate function and the momentum function. Linear and self-adjoint operators. Eigenvalues and eigenfunctions of operators. The concept of "quantization". Average values of operators. Commutation of operators. Topic 14. Atomic structure and its properties. Atomic structure. Quantum mechanics of atoms and molecules. Quantum number. Bohr theory for the hydrogen atom. Spectra of hydrogen-like atoms. Energy levels. Bohr postulates. Frank and Gerst help. Concept of spin. Size of the atom. Atomic orbital and spin momenta. Large moment of the nucleus. Pauli principle. Mendeleev's help periodic table. Topic 15. Nuclear structure and its properties. Nuclear composition. Mass and binding energy of the nucleus. The phenomenon of radioactivity. Nuclear reactions and conservation laws in them. Universe. Big bang
Examination forms	<i>Paper examination</i>
Study and examination requirements	Written Examination: In this exam, the student is given 80 minutes to write answers to the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are written for all questions – 5 (Excellent) 2. If answers are provided to all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good) 3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not match the questions – 2 (Unsatisfactory)

Reading list	12. Tursunmetov K.A., Turgunboev F.Yu., Xamidjonov I.X. Umumiy fizika kursidan praktikum "Mexanika" o'quv qo'llanma T.-2019 y. 13. Tursunmetov K.A., Daliev X.S. Mexanika 1-qism. Toshkent. Universtet 2000 y. 14. Nazirov E.N. va boshqalar. Mexanika va molekulyar fizikadan praktikum. O'zbekiston, T.-2001 y. 15. Tursunmetov K.A. va boshqalar. Umumiy fizika kursidan praktikum. Mexanika. Universitet. T.-1998 y. 16. Landsberg G.S. "Optika" T.-1981. 17. Kaliteevskiy N.I. "Volnovaya optika" M. 1971. M. 2006. 18. Karimov R., Otajonov Sh., Eshjanov B., Buribaev L. Optikadan masalalar va laboratoriya ishlari to'plami. O'quv qo'llanma, Toshkent, 2012. 19. Polvonov S.R., Ruzimov Sh.M., Mamajusupova M.I. Atom va yadro fizikasidan laboratoriya ishlari. T. "UNIVERSITET", 2020. -120 b. 20. Kanokov Z., Karaxodjaev A.K., Nasriddinov K.R., Polvonov S.R. Atom va yadro fizikasidan laboratoriya ishlari. Universitet. T. -2002. 21. Boyarkina A.N., Goncharov N.G. i dr. Praktikum po yadernoy fizike. M. : Izd-vo Moskovskogo un-ta, 1988. -199 s. 22. Polvonov S.R., Kanokov Z., Ruzimov Sh.M. Atom va yadro fizikasidan masalalar to'plami. T. "UNIVERSITET", 2017. -200 b. Additional literature 23. Sh.M. Mirziyoyev. "Erkin va farovon, demokratik O'zbekiston davlatini birgalikda barpo etamiz". Toshkent: "O'zbekiston", 2016. -56 b. 24. Yangi tahrirdagi O'zbekiston Respublikasi Konstitutsiyasi. 2023 yil 1-may. № O'RQ - 837 25. Strelkov S.P. Mexanika – Toshkent, "O'qituvchi", 1977. 26. Sivuxin D.P. Umumiy fizika kursi. 1-tom. Mexanika. Toshkent, "O'qituvchi", 1981. 27. Kikoin A.K., Kikoin I.K. Umumiy fizika kursi. Molekulyar fizika. "O'qituvchi", Toshkent 1978 y. 28. Sivuxin D.V. Umumiy fizika kursi. Termodinamika va molekulyar fizika. "O'qituvchi", Toshkent-1984. 29. Sivuxin D.V. "Optika" "Fizmat" M. 2005. 30. Qo'zilyev B.T. "Optika" "Fan va texnologiya" T. 2014. 31. Ahmadjonov O.I. Fizika kursi. Mexanika va molekulyar fizika. Toshkent, "O'qituvchi", 1985.
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32. Xaykin S.E. Fizicheskie osnovy mexaniki. M. "Nauka" 1971.
33. Zaydel I. Elementarnye otsenki oshibok izmereniy. M., 1959.
34. Reyf F. Statisticheskaya fizika. M., Nauka 1977, 1983.
35. Matveev A.N. Molekulyarnaya fizika. M. 1985.
36. Otajonov Sh., Eshchanov B.X. Optika. O'UM, O'zMU, 2015.
37. F.X. Tuxvatullin, A. Jumaboev, Sh.F. Fayzullaev, U.N. Tashkenbaev, G. Muradov. "Optika", O'quv qo'llanma, Samarqand, SamDU, 2004.
38. Otajonov Sh. "Molekulyar fizika" T. 1994.
39. Muminov T.M., Xoliqov A.B., Xolmurodov Sh.X. Atom yadrosi va zarralar fizikasi. T.: O'zbekiston faylasuflar jamiyati, 2009. -288 b.
40. Teshaboev Q.T. Yadro va elementar zarralar fizikasi. T. 1992.
41. Muxin K.N. Eksperimentalnaya yadernaya fizika: Uchebnik. V 3-x tt. T.
42. Fizika atomnogo yadra. 7-ye izd., ster.- SPb.: Izd-vo "Lan". 2009. -384.
43. Xudson D. Statistika dlya fizikov. Per. S angl. M.: Mir, 1967. -292 s.
44. Jukovskiy Yu.G., Sergeev V.O., Antoneva N.M. i dr. Praktikum po yadernoy fizike. M.: Vysshaya shkola, 1975. -197 s.

Information sources

14. Animatsion rolik (<http://www.upscale.utoronto.ca>. va html, <http://tactical.ua.es>).
15. Fizika "Physicon".
16. Fizikadan o'quv kinofilmlari.
17. Ko'rgazmali rangli rasmlar (<http://www.hordWareandlysis.com>).
18. Physics online.
19. www.cultinfo/fulltext/1/008/077/561/html
20. www.en/edu.ru. Portal.
21. <https://physicon.ru>
22. <http://www.physics-online.ru>
23. <http://www.en.edu.ru/>
24. <http://cdfc.sinp.msu.ru> (MDU yadro ma'lumotlar markazi, Rossiya)
25. <http://www.inp.uz> (O'zFA Yadro fizikasi instituti)
26. <http://www.phys.msu.ru> (MDU fizika fakulteti sayti, Rossiya).

Module designation	Alg1305 Algebra		
Semester(s) in which the module is taught	3-Semester		
Person is responsible for the module	Muhayyo Jo‘rayeva		
Language	Uzbek language		
Relation to curriculum	Compulsory course		
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.		
Workload (incl. contact hours, self-study hours)	Workload for 3 ECTS (150 hours): Lectures: 30 hours Practical training 30 hours Self-Study and Independent Learning:90 hours		
Credit points	Credits 5	Cr 5	ECTS 3
Required and recommended prerequisites for joining the module	Mathematical analysis and Linear Algebra		
Module objectives/intended learning outcomes	The main goal of teaching algebra is to familiarize students with the necessary set of mathematical information (concepts, statements and their proofs, methods for solving practical problems, etc.). At the same time, it helps students think logically, draw correct conclusions, and improve their mathematical culture		
Content	1.Semigroups. Monoids.Groups 2. Symmetric groups. Alternating groups. Subgroups. Cyclic groups 3. Right and left cosets. Lagrange's theorem 4. Normal subgroups.Factor groups 5. Homomorphisms and isomorphisms of a group 6. Properties of homomorphisms and isomorphisms. Cayley's theorem 7. Theorems about homomorphisms 8. Group automorphisms and inner automorphisms 9. Group 's the influence on a set 10. Rings,fields and areas. Partial rings and partial areas 11. Ring of deductions. Finite fields. Characteristics of the field 12. Ideals of a ring. Factor rings. Principal ideal ring 13. Homomorphisms and isomorphisms of a ring 14. Theorems about homomorphisms (for rings). 15. Boolean and regular rings		
Examination forms	Paper examination		
Study and examination requirements	It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the		

	forms of current and intermediate control, and submit a test or written work for final control.
Reading list	1.P. H. Nazarov, B. T. Toshpulatov, A. D. Dusumbetov “Algebra va sonlar nazariyasi ” I qism, Toshkent “O‘qituvchi”, 1993 2.A. G. Kurosh “ Oliy algebra kursi ” I qism, Toshkent, “O‘qituvchi”, 1976 3.J. Xojiev, A. S. Faynleyb “ Algebra va sonlar nazariyasi kursi”, Toshkent - "O‘zbekiston" - 2001 4.D. K. Faddeev “Leksii po algebre”, Moskva “Nauka”1984 5.Ash. R. V. Abstract Algebra. USA, 2000. 6.Malik D.S., Mordeson J.N., Sen M.K., Fundamentals of abstract algebra.- WCB McGraw-Hill, 1997, p.636. 7.Kostrikin A.I. «Vvedeniye v algebru» M. 1977 g. LengS. «Algebra» M. 1968 g

Module designation	ChA11210 Linear Algebra
Semester(s) in which the module is taught	1-Semester
Person is responsible for the module	Muhayyo Jorayeva
Language	Uzbek language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 1 ECTS (300 hours): Lectures: 60 hours Practical training 60 hours Self-Study and Independent Learning: 180 hours
Credit points	10
Required and recommended prerequisites for joining the module	Mathematical analysis and Analytic Geometry
Module objectives/intended learning outcomes	The main goal of teaching linear algebra is to familiarize students with the necessary set of mathematical information (concepts, statements and their proofs, methods for solving practical problems, etc.). At the same time, it helps students think logically, draw correct conclusions, and improve their mathematical culture
Content	1. Gaussian method for solving systems of linear equations. Matrices and operations on them 2. Small-order determinants. Permutations and substitutions. 3. n-order determinants and their properties. 4. Laplace's theorem. Algebraic complements (cofactors) and minors. Laplace's theorem 5. Determinant and additional properties of matrices. Inverse matrix 6. Cramer and inverse matrix methods for solving systems of linear equations 7. n-dimensional vector space. Linear dependence. Basis of a vector space. 8. Matrix color. Kronecker-Capelli theorem. 9. System of homogeneous equations. Fundamental solution 10. Complex numbers and operations on them. Moivre's formula 11. Finding the n-th roots of a complex number. 12. Polynomials with one unknown. Gerner scheme. Bezu's theorem 13. Remainder. Enumeration of polynomials. Irreducible polynomials 14. Rational fractions and their expansion into simplest fractions 15. Root limits. Sturm's theorem 16. Linear spaces

	17. Euclidean space 18. Orthogonal complement 19. Linear, bilinear, and quadratic forms 20. Quadratic form 21. Law of inertia 22. Complex Euclidean spaces 23. Linear transformations 24. Inverse transformation 25. Invariant subspaces 26. Adjoint transformation 27. Unitary transformations 28. Commuting transformations 29. Jordan normal form of a linear transformation matrix
Examination forms	<i>Paper examination</i>
Study and examination requirements	It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and intermediate control, and submit a test or written work for final control.
Reading list	1. Ayupov A.SH., Omirov B.A, Xudoyberdiyev A.X, Gaydarov F.X., Algebra va sonlar nazariyasi, Toshkent, "Tafakkur bo'stoni", 2019 y. 2. P.H. Nazarov, B.T.Toshpulatov, A.D.Dusumbetov "Algebra va sonlar nazariyasi", I qism, Toshkent "Uqituvchi» nashriyoti, 1993 y. 3. Poskuryakov I.L. Sbornik zadach po lineynoy algebre."Nauka", 2005. 4. Xojiev J.X., Faynleyb A.S. Algebra va sonlar nazariyasi kursi. Toshkent, "Uzbekiston", 2001 y. 5. Faddeev D.K., Sominskiy I.S. Zadachi po vysshey algebre, Sankt- Peterburg, 1999 g 6. Faddeev D.K. Leksii po algebre, M., "Nauka" 1984g. 7. Kostrikin A. I. i dr., Sbornik zadach po algebre. "Nauka", 1986g 8. Kenneth Kuttler. Elementary linear algebra. 2012, Ventus Publishing Aps, ISBN 978-87-403-0018-5.
Module designation	<i>DGT13409 Differential Geometry and Topology</i>
Semester(s) in which the module is taught	<i>3-semester, 4-semester</i>
Person is responsible for the module	<i>Ra'no Abdiraxmanova</i>
Language	<i>Uzbek language</i>
Relation to curriculum	<i>Compulsory course</i>
Teaching methods	<i>Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.</i>

Workload (incl. contact hours, self-study hours)	<i>Workload for 9 ECTS (270hours):</i> <i>Lectures: 60hours</i> <i>Practical training 60hours</i> <i>Self-Study and Independent Learning: 150hours</i>
Credit points	9 (5+4)
Required and recommended prerequisites for joining the module	<i>Differential Equations, Analytic Geometry, Mathematical Logic, Algebra, and Mathematical Analysis.</i>
Module objectives/intended learning outcomes	<i>The objective of the course is to develop students' skills in applying topological methods and differential calculus techniques in the study of geometric objects.</i>
Content	<i>Topics included in the course:</i> <i>1. Euclidean space and Euclidean topology. Metric spaces and metric topology.</i> <i>2. Topological spaces: continuity and convergence. Basic properties of open and closed sets in topological spaces.</i> <i>3. Constructing topological spaces: product spaces, subspaces, and quotient spaces.</i> <i>4. Basis of a topology. Constructing a topology using a basis.</i> <i>5. Separation axioms. Urysohn's lemma.</i> <i>6. Connected sets in topological spaces and their properties.</i> <i>7. Compact sets and their properties.</i> <i>8. Compactness in Euclidean spaces: compactness of a closed interval and a closed cube.</i> <i>9. Continuous mappings: definition and examples. Theorems on continuity.</i> <i>10. Connectedness and compactness under continuous mappings. Theorems on path-connected sets and their properties.</i> <i>11. Topological mappings (homeomorphisms): properties and examples. Stereographic projection.</i> <i>12. Topological groups. Construction of the Möbius strip.</i> <i>13. Homotopic mappings, the fundamental group. Homotopy type.</i> <i>14. Brouwer's fixed-point theorem.</i> <i>15. Simplicial homology: simplex, boundary operator, cycles and boundaries, homology groups, construction examples.</i> <i>16. Curves and their methods of representation.</i> <i>17. Tangent line and osculating plane of a curve.</i> <i>18. Arc length of a curve and natural parameterization.</i>

	19. Curvature and torsion of a curve. 20. The concept of a surface and its methods of representation. 21. Elementary, simple, and general surfaces. 22. Tangent plane of a surface. 23. The first fundamental form of a surface. 24. The second fundamental form of a surface. 25. Fundamental equations of a surface. 26. Relationship between the first and second fundamental forms. Bonnet's theorem. 27. Intrinsic geometry of a surface. 28. Vector fields and their integral curves. 29. Parallel transport of vectors along a surface. 30. The Gauss–Bonnet theorem. Surfaces of constant curvature.
Examination forms	Paper examination
Study and examination requirements	It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and intermediate control, and submit a test or written work for final control.
Reading list	1. Aleksandrov A.D. <i>Выпуклые многогранники</i>. Moskva, Leningrad, Gos. izd-vo tekhniko-teoretich. lit-ry, 1950. Alexandrov V. Minkowski-type and Alexandrov-type theorems for polyhedral herissons, 2002, 2. Armstrong M.A. <i>Basic Topology</i>. Springer, 1998. 7 Narmanov A.Ya. <i>Differensial geometriya</i>. T. Turon-Iqbol, 2016. 225 bet. 8 Narmanov A.Ya, Sharipov A.S., Aslonov J.O. <i>Differensial geometriya va topologiya kursidan masalalar to'plami</i>, T.: Universitet, 2014. 9 Miushenko A. S, Fomenko A. T. <i>Kratkiy kurs differensialnoy geometrii i topologii</i>. M.: fizmatlit, 2004. 304 s. 10 SIDNEY A. MORRIS. TOPOLOGY WITHOUT TEARS, 2003. 11 Alexei Sossinsky. Knots: mathematics with a twist. Harvard University Press, 2002. 12 Fedorchuk V.V., Filippov V.V. Obuqaya topologiya. Osnovnye konstruksii. Moskva, Fizmatlit, 2006.

Module designation	ALGB205 Algebra						
Semester(s) in which the module is taught	3-Semester						
Person is responsible for the module	Muhayyo Jo‘rayeva						
Language	Uzbek language						
Relation to curriculum	Compulsory course						
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.						
Workload (incl. contact hours, self-study hours)	Workload for 3 ECTS (150 hours): Lectures: 30 hours Practical training 30 hours Self-Study and Independent Learning:90 hours						
Credit points	<table><tr><td>Credits</td><td>Cr</td><td>ECTS</td></tr><tr><td>5</td><td>5</td><td>3</td></tr></table>	Credits	Cr	ECTS	5	5	3
Credits	Cr	ECTS					
5	5	3					
Required and recommended prerequisites for joining the module	Mathematical analysis and Linear Algebra						
Module objectives/intended learning outcomes	The main goal of teaching algebra is to familiarize students with the necessary set of mathematical information (concepts, statements and their proofs, methods for solving practical problems, etc.). At the same time, it helps students think logically, draw correct conclusions, and improve their mathematical culture						
Content	1.Semigroups. Monoids.Groups 2. Symmetric groups. Alternating groups. Subgroups. Cyclic groups 3. Right and left cosets. Lagrange's theorem 4. Normal subgroups.Factor groups 5. Homomorphisms and isomorphisms of a group 6. Properties of homomorphisms and isomorphisms. Cayley's theorem 7. Theorems about homomorphisms 8. Group automorphisms and inner automorphisms 9. Group 's the influence on a set 10. Rings,fields and areas. Partial rings and partial areas 11. Ring of deductions. Finite fields. Characteristics of the field 12. Ideals of a ring. Factor rings. Principal ideal ring 13. Homomorphisms and isomorphisms of a ring 14. Theorems about homomorphisms (for rings). 15. Boolean and regular rings						
Examination forms	Paper examination						
Study and examination requirements	It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and						

	intermediate control, and submit a test or written work for final control.
Reading list	1.P. H. Nazarov, B. T. Toshpulatov, A. D. Dusumbetov “Algebra va sonlar nazariyasi ” I qism, Toshkent “O‘qituvchi”, 1993 2.A. G. Kurosh “ Oliy algebra kursi ” I qism, Toshkent, “O‘qituvchi”, 1976 3.J. Xojiev, A. S. Faynleyb “ Algebra va sonlar nazariyasi kursi”, Toshkent - "O‘zbekiston" - 2001 4.D. K. Faddeev “Leksii po algebre”, Moskva “Nauka”1984 5.Ash. R. V. Abstract Algebra. USA, 2000. 6.Malik D.S., Mordeson J.N., Sen M.K., Fundamentals of abstract algebra.- WCB McGrew-Hill, 1997, p.636. 7.Kostrikin A.I. «Vvedeniye v algebru» M. 1977 g. LengS. «Algebra» M. 1968 g

Module designation	DT1406 <i>Differential equations</i>
Semester(s) in which the module is taught	<i>4-semester (credit 6)</i>
Person is responsible for the module	<i>Dusanova Umida</i>
Language	<i>Uzbek language</i>
Relation to curriculum	<i>Compulsory (Core) Course</i>
Teaching methods	<i>Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.</i>
Workload (incl. contact hours, self-study hours)	<i>Workload for 4 ECTS (180 hours):</i> <i>Lectures: 46 hours</i> <i>Practical training 44 hours</i> <i>Self-Study and Independent Learning: 90 hours</i>
Credit points	<i>Total Credits: 6</i> <i>ECTS: 6</i>
Required and recommended prerequisites for joining the module	• <i>Mathematical Analysis</i> • <i>Linear Algebra and Analytic Geometry</i> • <i>Basic methods of solving mathematical equations</i> • <i>Fundamentals of functions and their properties</i> • <i>Differential and Integral Calculus</i>
Module objectives/intended learning outcomes	<i>Upon successful completion of this module, students will be able to:</i> • <i>Solve both computational and theoretical problems in differential equations, demonstrating a solid understanding of fundamental concepts and solution techniques</i> • <i>Establish logical relationships between key definitions, concepts, and theorems in the theory of differential equations</i> • <i>Construct and present rigorous mathematical proofs for classical results and related problems in differential equations</i> • <i>Apply various methods of solving ordinary differential equations to both theoretical and applied problems</i> • <i>Select and combine appropriate analytical and numerical methods for solving different types of differential equations</i> • <i>Analyze and interpret solutions of differential equations, including their qualitative behavior and practical meaning</i> • <i>Demonstrate well-developed skills in critical thinking, mathematical modeling, and logical reasoning in the context of differential equations</i>
	4.

Content	☐ Differential equations with separable variables, homogeneous differential equations, and reducible-to-homogeneous differential equations. ☐ Cauchy problem for a first-order differential equation. The theorem on the existence and uniqueness of the solution. ☐ First-order differential equations not solved with respect to the derivative and methods of their integration. The theorem on the existence of solutions. ☐ n-th order differential equations. Methods for solving certain n-th order differential equations. ☐ Solving an n-th order homogeneous differential equation using a system of fundamental solutions. The Ostrogradsky–Liouville formula. ☐ n-th order non-homogeneous linear differential equations with constant coefficients. ☐ Systems of homogeneous differential equations with constant coefficients. ☐ Matrix exponential. ☐ Concept of stability. Stability of the solution of a linear homogeneous system of differential equations.
Examination forms	Paper examination
Study and examination requirements	Students are required to: • Attend lectures and practical sessions regularly and actively participate in practical classes • Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving • Successfully complete all midterm assessment tasks • Achieve the minimum required score in continuous assessment to be admitted to the final examination • Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills
Reading list	1. A.A'zam. <i>Differensial tenglamalar.</i>, Toshkent, 2024. 2. N.Dilmurodov. <i>Oddiy differensial tenglamalar.</i>, Darslik, "Toshkent" 2019. 3. N.Dilmurodov. <i>Oddiy differensial tenglamalardan misollar, masalalar va topshiriqlar. O'quv qo'llanma</i>, "Qarshi" 2020. 4. P. A. Velmisov, Yu. V. Pokladova, T. B. Rasputko. <i>Differensialnye uravneniya. Uchebnoe posobie</i>, Ulyanovsk, UIGTU-2017.
Module designation	DMMM1406 Discrete Mathematics and Mathematical Logic
Semester(s) in which the module is taught	4-Semester
Person is responsible for the module	Saidov Sardor

Language	Uzbek language		
Relation to curriculum	Compulsory course		
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.		
Workload (incl. contact hours, self-study hours)	Workload for 6 ECTS (180 hours): Lectures: 44 hours Practical training 46 hours Self-Study and Independent Learning: 90 hours		
Credit points	Credits 7(3+4)	Cr 6	ECTS 3
Required and recommended prerequisites for joining the module	Mathematical analysis, Linear Algebra and Analytic Geometry,		
Module objectives/intended learning outcomes	The purpose of teaching the course is to introduce students to the essential knowledge of Discrete Mathematics and Mathematical Logic (concepts, theorems and their proofs, methods for solving practical problems, etc.). At the same time, it aims to develop students' logical thinking, ability to construct correct arguments, and mathematical culture.		
Content	Topics included in the course: 1. Sets and operations on them. 2. Relations. Binary relations. Special binary relations. Equivalence relations. Partially ordered sets. 3. Propositions and operations on propositions. Truth table. Formula, subformula. 4. Equivalence of formulas. Basic equivalences of propositional algebra. 5. Normal forms of propositional algebra formulas. Perfect conjunctive and disjunctive normal forms. 6. Boolean functions and methods of their representation. The number of Boolean functions. Elementary Boolean functions. 7. Dual functions. Principle of duality. Expansion of Boolean functions with respect to variables. 8. Perfect disjunctive normal form. Perfect conjunctive normal form. Zhegalkin polynomial. 9. Completeness and closure of a system of functions.		

	10. Important closed classes. Class of constant-preserving functions. Self-dual function class. Monotone function class. Linear function class. Post's theorem. 11. Propositional calculus. Derivation. Concept of proof. Concept of theorem. Axioms of propositional calculus. 12. Deduction theorem and its applications. Gödel's completeness theorem. Consistency of propositional calculus. Completeness of propositional calculus. Independence of the axiom system of propositional calculus. 13. Concept of predicate (logical function). Operations on predicates. 14. Quantifier operations on predicates. Predicate logic formulas. 15. Equivalent formulas. Basic equivalences. Satisfiable formulas. Tautologies. 16. Basic elements of combinatorics. Basic combinations. 17. Inclusion–exclusion principle. 18. Recurrence relations method. Fibonacci numbers. 19. Generating functions. 20. Graphs and methods of their representation. Types of graphs. 21. Connectivity of graphs. Euler and Hamiltonian graphs. 22. Directed graphs. Graph coloring. Chromatic numbers.
Examination forms	<i>Paper examination</i>
Study and examination Requirements	<i>It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and intermediate control, and submit a test or written work for final control.</i>

Reading list	1.Kenneth H. Rosen, Discrete mathematics and its applications, 7-edition, The McGraw-Hill Companies, 2012 2.Mendelson E. Vvedenie v matematicheskuyu logiku. M.: Nauka, 1984 3.Yablonskiy S. V. Vvedenie v diskretnuyu matematiku. – M.: Nauka, 1986. 4.Yunusov A.S. Matematik mantiq va algoritmlar nazariyasi elementlari. T., 2008yu 5.Lavrov I. A., Maksimova L. L. Zadachi po teorii mnojestv, matematicheskoy logike i teorii algoritmov. M.: Fiz.-mat. literatura, 1995. 6.To‘raev X. Azizov I. Otaqulov S. Kombinatorika va graflar nazariyasi. 7. A.X. Xudoyberdiyev, Kombinatorika va graflar nazariyasi. Toshkent, 207. 8.Abulov M.O. Diskret matematika va matematik mantiq fanidan misollar va masalalar to‘plami. Qarshi DU. 2020. 390 bet
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Module Name	Theoretical mechanics
Code (if applicable)	NM1404
Semesters Taught	4
Lecturer	Yuldash Babajanov – Associate Professor of the Department of Industrial Engineering Karimova Salima – Lead Instructor Department of Industrial Engineering
Language of Instruction	Uzbek
Relation to Curriculum	Mandatory subject
Type of Teaching, Contact Hours	Lecture, Practical Sessions
Total Workload	120 hours
Contact Hours	60 hours (Lecture – 30 hours, Practical – 30 hours)
Self-study	60 hours
Credit Points	4
Recommended Prerequisites	Chemistry, Physics

Module objectives / intended learning outcome	CONTENT OF THE SUBJECT
	The main content of teaching this subject is for students to study the general laws of the mechanical motion of material bodies and the forces they exert on each other. The subject of theoretical mechanics is divided into three parts depending on the perspective from which mechanical problems are considered: statics, kinematics, and dynamics. The equilibrium of material bodies, the application and decomposition of forces acting on them, and the replacement of these forces by an equivalent system of forces with the same effect are studied in the statics section of theoretical mechanics. The study of the motion of bodies, considering only geometric aspects and without taking into account their mass or the forces acting on them, belongs to the kinematics section. Dynamics studies the motion of material bodies together with the forces that cause this motion. Purpose of teaching the subject: The purpose of teaching this subject is to provide students with the opportunity to study mechanical motions occurring in nature, to create new mechanisms used in production, to study and analyze the motion of celestial bodies, and, in general, to study physical processes in nature using the laws and principles of mechanics. Tasks of the subject: The tasks of the subject are to enable future specialists to independently solve various mechanical problems and issues that may arise in their future industrial and scientific-technical activities, to implement new modern technologies in the production process, to manage production processes, and to develop the worldview, general culture, and intellectual abilities of future engineers.

Content	Topics
	Topic 1: Introduction. Numbering system. Coordinate system. Topic 2: Lagrange formalism. Topic 3: Principle of relativity. Topic 4: The first law of thermodynamics and thermodynamic processes. Topic 5: Lagrange functions of physical systems. Topic 6: Laws of conservation. Topic 7: Integration of equations of motion. Topic 8: Collision of particles. Topic 9: Linear small oscillations. Topic 10: Canonical formalism. Topic 11: Hamilton–Jacobi method for describing a physical system. Topic 12: Motion of a rigid body. Topic 13: Calculation of the moments of inertia of a rigid body. Topic 14: Equations of motion of a rigid body; Euler equations. Topic 15: Concept of continuum mechanics. III. Guidelines and Recommendations for Practical Classes The department develops guidelines and recommendations for organizing practical classes. In these, students reinforce the knowledge and skills gained from the main lecture topics through practical problems and case studies. Additionally, based on textbooks and educational materials, students are recommended to: • Consolidate their knowledge, • Use reference materials, • Enhance their understanding through scientific articles and theses, • Solve problems, • Prepare presentations and visual aids on topics, • Use normative and legal documents as references. Practical Tasks - Problems related to the geometric equilibrium condition of intersecting force systems. - Dynamics of a point. - Construction of Lagrange functions and equations. - Finding equivalent Lagrange functions. - Laws of conservation. - Integration of equations of motion. - Kepler problems. - Particle collisions. - Small oscillations. - Canonical equations, Hamilton function. - Poisson brackets. - Hamilton–Jacobi equations. - Kinetic moment and energy of a rigid body. - Calculation of the kinetic energy of a rigid body. - Motion in a central field. Practical classes should be conducted in a classroom equipped with an

Study and examination requirements and forms of examination	Written Examination: In this exam, the student is given 80 minutes to write answers to the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are written for all questions – 5 (Excellent) 2. If answers are provided to all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good) 3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not match the questions – 2 (Unsatisfactory)
Media employed	Completion of science assignments and submission of current, intermediate, and final control forms
Reading list 1	1. Rashidov T.R. et al. Theoretical Mechanics. Tashkent: VNESHINVESTPROM, 2020. 2. To'rayev X., Tilavov A. Theoretical Mechanics. Vol. 1. Tashkent: Noshir, 2012. 3. Bukholts N.N. Fundamental Course of Theoretical Mechanics. Parts 1 & 2. St. Petersburg: Lan, 2021, 2023. – 448 pp. – 336 pp. (electronic version) 4. Shokhaydarova P. et al. Theoretical Mechanics. Tashkent: O'qituvchi, 1990. 5. Meshersky I.V. Collection of Problems in Theoretical Mechanics. Tashkent: O'qituvchi, 1989. 6. Tom W.B. Kibble, Frank H. Berkshire, Classical Mechanics. Imperial College Press, 2004. 7. Fayzullayev B. Theoretical Mechanics. Tashkent, 2023. Additional Reading 8. Herbert Goldstein, Charles Poole, John Safko, Classical Mechanics. Pearson New International Edition, USA, 2013. 9. Loitsyanski L.G., Lurie A.I., Course of Theoretical Mechanics. Vol. 1 & 2. Moscow: Nauka, 1983. 10. Yablonsky A.A., Collection of Term Papers in Theoretical Mechanics. Moscow: Nauka, 1985. 11. Kilchevsky N.A., Course of Theoretical Mechanics. Vol. 1 & 2. Moscow: Nauka, 1977. 12. Vasile Szolga, Theoretical Mechanics. Lecture Notes and Sample Problems, Part One. 2010. Internet Resources 1. www.gov.uz – Official portal of the Republic of Uzbekistan. 2. www.lex.uz – National database of legal documents of the Republic of Uzbekistan. 3. https://djvu.online/file/njpjNSfSY0iTmhttp://dhes.ime.mrsu.ru/studies/tot/Iit.html 4. https://library.samdpi.uz/ebooks/view?id=11764

	5. https://kutubxona.samduuf.uz/download/5
Reviewers	Anver Teymurkhanov – Associate Professor, Department of Industrial Engineering, PhD in Technical Sciences O. Eshqobilov – Professor, Karshi State University, Doctor of Technical Sciences
Confirmed place and time	The curriculum was approved by Karshi State University in 2025 by protocol No. 6 dated 02.07.2025 and authorized for confirmation.”

Module designation	ENMS15609 Probability theory and Mathematical statistics
Semester(s) in which the module is taught	6-Semester , 7-Semester
Person is responsible for the module	Imomov A`zam
Language	Uzbek language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 5,6 ECTS (4 credits): Lectures: 60 hours Practical training 60 hours Self-Study and Independent Learning: 150 hours
Credit points	9 (2+2+5)
Required and recommended prerequisites for joining the module	Mathematical analysis, Algebra, Linear Algebra and Analytic Geometry,
Module objectives/intended learning outcomes	After completing this course, students will be able to: solve theoretical and computational problems in probability theory; apply the basic concepts and methods of probability theory in practical problems; analyze random events and random variables; compute probabilities and expectations of random variables; establish relationships between probability theory and mathematical statistics.
Content	Topics included in the course: 1. Subject of probability theory. Stochastic experiments. Elements of combinatorics. 2. Sample space of elementary events. Algebras and σ-algebras. Concept of probability. 3. Classical and geometric definitions of probability. Axioms of probability theory. 4. Conditional probability. Independence of events. Total probability and Bayes formulas. 5. Sequence of independent experiments. Bernoulli scheme and formula. Binomial distribution. 6. De Moivre–Laplace local and integral limit theorems. 7. De Moivre–Laplace local and integral limit theorems.

	8. Poisson theorem. Applications of the integral limit theorem. 9. Random variables and their distribution functions. 10. Properties of distribution functions. Important distributions. 11. Discrete and continuous distributions. Density functions. Conditional distributions. 12. Numerical characteristics of random variables. Mathematical expectation. 13. Conditional expectation. 14. Variance and its properties. 15. Higher order moments. Correlation coefficient. 16. Inequalities. 17. Law of large numbers. 18. Conditions for the law of large numbers. 19. Characteristic functions and their properties. 20. Characteristic functions of some distributions. 21. Method of characteristic functions. Central limit theorem. 22. Lyapunov theorem. 23. Main problems of mathematical statistics. 24. Empirical distribution function. Empirical indicators. 25. Concept of statistical estimation. 26. Confidence interval estimation of unknown parameters. 27. Confidence intervals for the mean of the normal distribution. 28. Confidence intervals for the standard deviation of the normal distribution. 29. Related distributions: Chi-square, Student and Fisher distributions.
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	30. Pearson chi-square statistic.
Examination forms	<i>Paper examination</i>
Study and examination requirements	Students must complete all assignments, participate in practical classes, and pass the final examination. The final exam evaluates theoretical knowledge of probability theory and the ability to solve computational and applied problems.
Reading list	1. Sh.Q. Formanov. <i>Ehtimolliklar nazariyasi</i>, Toshkent, “Universitet”, 2014 y 2. A.A.Borovkov. <i>Teoriya veroyatnostey</i>, Moskva, «Editorial-URSS», 1999 g. 3. A.A.Borovkov. <i>Matematicheskaya statistika</i>, Moskva, «Lan», 2010 g 4. G.I.Ivchenko, Yu.I.Medvedov. <i>Vvedenie v matematicheskuyu statistiku</i>. Moskva, «LKI», 2010. 5. .Blitzstein, J. K., & Hwang, J. Introduction to Probability. CRC Press, 2019. 6. DeGroot, M. H., & Schervish, M. J. Probability and Statistics (5th Edition). Pearson, 2018. 7. Wasserman, L. All of Statistics: A Concise Course in Statistical Inference. Springer, 2020 edition. 8. Grimmett, G., & Stirzaker, D. Probability and Random Processes (4th Edition). Oxford University Press, 2020. 9. Rice, J. A. Mathematical Statistics and Data Analysis (3rd Edition). Cengage Learning, 2018 edition.

Module designation	1.KO'FN15609, Theory of functions of a complex variable (TFCV)
Semester(s) in which the module is taught	5 semester (credit 5) , 6 semester (credit 4)
Person is responsible for the module	Norov Asliddin
Language	Uzbek language
Relation to curriculum	Compulsory (Core) Course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 5,6 ECTS (270 hours): Lectures: 60 hours Practical training: 60 hours Self-Study and Independent Learning: 150 hours
Credit points	Total Credits: 9 ECTS: 5–6
Required and recommended prerequisites for joining the module	• Mathematical Analysis • Algebra • Linear Algebra and Analytic Geometry
Module objectives/intended learning outcomes	Upon successful completion of this module, students will be able to: • Solve both computational and theoretical problems in TFCV, demonstrating a deep understanding of core concepts and techniques; • Establish logical relationships between fundamental definitions, concepts, and theorems within TFCV; • Construct and present rigorous mathematical proofs for both classical results and newly formulated analogous statements • Apply a wide range of methods from TFCV to investigate theoretical and applied problems • Select and combine appropriate analytical methods and techniques for solving complex mathematical tasks • Analyze and interpret abstract mathematical structures, ensuring logical consistency and mathematical rigor • Demonstrate advanced skills in critical thinking, abstraction, and mathematical reasoning
	5.
Content	• Complex numbers, forms of a complex number, complex plane • Functions of a complex variable and their continuity • Differentiability of a function

	• <i>Conformal mappings</i> • <i>Elementary functions</i> • <i>Joukowski function</i> • <i>Integral of functions of a complex variable, its properties, and relation to contour integrals</i> • <i>Power series</i> • <i>Properties of holomorphic functions</i> • <i>Elements of residue theory</i>
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>Students are required to:</i> • <i>Attend lectures and practical sessions regularly and actively participate in practical classes</i> • <i>Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving</i> • <i>Successfully complete all midterm assessment tasks</i> • <i>Achieve the minimum required score in continuous assessment to be admitted to the final examination</i> • <i>Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills</i>
Reading list	1. <i>G.Xudoyberganov, B.A.Shoimqulov, Kompleks o'zgaruvchili funktsiyalar nazariyasi, Toshkent: O'zMU nashriyoti 2023. Jild 1. 200 bet.</i> 2. <i>Tuychiev T.T., Tishabaev J.K., Djumabaev D.X., Kitmanov A.M., Kompleks o'zgaruvchili funktsiyalar nazariyasi fanidan mustaqil ishlar, T. "Mumtoz so'z", 2018.</i> 3. <i>Sadullaev A., Xudoyberganov G., Mansurov X. T., Vorisov A. K., Tuychiev T. T. Matematik analiz kursidan misol va masalalar to'plami (kompleks analiz) 3 qism. T. "O'zbekiston", 2000.</i> 4. <i>Shabat B. V. Vvedenie v kompleksnyy analiz. M. URSS, 2015.</i> 5. <i>Volkovskiy L. I., Luns G. A., Aramanovich I. G. Sbornik zadach po teorii funktsiy kompleksnogo peremennogo. M. «FIZMATLIT», 2002.</i>

Module name:	General pedagogy
Code, if applicable:	UPed1505
Semesters in which the module is taught:	5
Lecturer:	Oysara Karakhanova, senior teacher
Language	Uzbek

Relation to curriculum:	elective
Type of teaching, contact hours:	Lecture, practical
Workload:	150 hours - soati Contact hours: 60 hours; auditoriya soati lecture – 30 hours; practical – 30 hours Self-study: 90 hours – mustaqil ta'lim
Credit points:	5
Recommended prerequisites:	General psychology

Module objectives Intended learning outcome	The purpose of teaching the subject is to equip future teachers with the theoretical and historical foundations of modern pedagogical science and knowledge of teaching skills, to teach them to rationally organize the educational process based on the requirements established by the Law of the Republic of Uzbekistan "On Education", to effectively use pedagogical heritage, and to demonstrate high pedagogical culture and techniques in real educational practice. As a result of mastering the subject, the student will acquire the following competencies: • motivational-cognitive - orientation to cognitive activity, awareness of educational and cognitive activity, creativity, behavior in non-standard situations, independence in solving educational tasks, interest and aspirations to master the profession of a teacher; • informational - working with information, protection from information attacks, mastering the culture of information consumption; • communicative - linguistic literacy, mastering the rules of literary and scientific style, mastering verbal and non-verbal speech skills, exchanging ideas, engaging in free dialogue in analyzing reality, expressing one's objective attitude to pedagogical reality; • awareness of the content and essence of the ideological-ideological-national idea, understanding the ideological landscape of the world, possession of ideological immunity, protection from ideological threats, understanding the personal and social essence of the national idea, clarifying the place of the national idea in pedagogical activity; • understanding the essence of reforms being carried out in the fields of citizenship - political, socio-economic, spiritual-educational, cultural, harmonious analysis of the national-cultural heritage, the past, present and future of the people, active participation in socio-political life. Show activity in projects carried out by local community life and self-government institutions, social movements; • spiritual and moral - mastering and applying the norms of behavior accepted in society, mastering high spiritual and moral qualities and turning them into the main criterion of pedagogical
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	activity, combating spiritual threats, preparing for the organization of spiritual propaganda and agitation; • acmeological confidence in oneself and the environment surrounding one, full understanding of one's desires and needs, identifying the current opportunities and prospects for future creative development, the ability to reflect, identify, interiorize, change one's views, beliefs and attitudes; • axiological - axiological assessment of pedagogical reality, understanding pedagogical phenomena as values, enjoying the pedagogical process, experiencing a sense of responsibility, understanding one's pedagogical position and readiness for pedagogical activity based on educational values.
Content	Topic 1: HISTORY OF PEDAGOGY AS A SCIENCE. EDUCATION IN PRIMITIVE COMMUNITY. EDUCATION AND PEDAGOGICAL IDEAS FROM THE MOST ANCIENT PERIODS TO THE 7TH CENTURY. EDUCATION, SCHOOL AND PEDAGOGICAL IDEAS IN CENTRAL ASIA FROM THE 7TH CENTURY TO THE FIRST HALF OF THE 14TH CENTURY. Topic 2: DEVELOPMENT OF PEDAGOGICAL IDEAS DURING THE EASTERN AWAKENING. DEVELOPMENT OF EDUCATIONAL AND MORAL IDEAS DURING THE EASTERN AWAKENING Topic 3: DEVELOPMENT OF EDUCATION, SCHOOL AND PEDAGOGICAL IDEAS IN MOVARAUNNAH IN THE SECOND HALF OF THE 14TH CENTURY AND IN THE 16TH CENTURY. Topic 4: DEVELOPMENT OF EDUCATION, SCHOOL AND PEDAGOGICAL IDEAS FROM THE 17TH CENTURY TO THE MIDDLE OF THE 19TH CENTURY. EDUCATION, SCHOOL AND PEDAGOGICAL IDEAS IN TURKESTAN IN THE 2ND HALF OF THE 19TH CENTURY - THE 1ST QUARTER OF THE 20TH CENTURY. Topic 5. EDUCATION SYSTEM AND DEVELOPMENT OF PEDAGOGICAL IDEAS IN UZBEKISTAN IN 1924-1991. EDUCATION SYSTEM OF INDEPENDENT UZBEKISTAN. DEVELOPMENT OF PEDAGOGICAL IDEAS IN THE YEARS OF INDEPENDENCE. Topic 6: HISTORY OF THE DEVELOPMENT OF WORLD PEDAGOGICAL SCIENCE FROM THE MOST ANCIENT PERIODS TO THE FIRST HALF OF THE 19TH CENTURY. PEDAGOGICAL THEORY OF Y.A. COMENIUS. Topic 7: EDUCATION SYSTEM OF THE COUNTRIES OF THE WORLD IN THE PRESENT PERIOD. TOPIC 8: HISTORY OF PEDAGOGICAL THOUGHT AND ISSUES OF TEACHER SKILLS IN SCHOOL PRACTICE. MAIN COMPONENTS OF PEDAGOGICAL SKILLS. Topic 9. Pedagogical competence in teacher activity. TOPIC 10: COMMUNICATIVE SKILLS AND INFLUENCE. CULTURE AND PSYCHOLOGY OF BEHAVIOR IN TEACHER ACTIVITY.

	TOPIC 11: PEDAGOGICAL TACT AND PEDAGOGICAL ETHICS TOPIC 12: CONCEPT OF PEDAGOGICAL TECHNIQUE. METHODOLOGY OF FORMING PEDAGOGICAL TECHNIQUE. TOPIC 13: SPEECH TECHNIQUE AND CULTURE. TOPIC 14: SCIENTIFIC ORGANIZATION OF TEACHER'S WORK. 15TH REPORT. SELF-EDUCATION AND WORK ON ONESELF. SYSTEM OF ACQUIRING PEDAGOGICAL EXPERIENCE. Seminar topics Topic 1: EDUCATIONAL ISSUES IN THE OLDEST WRITTEN MONUMENTS. THE SCIENCE OF HADITH AND ITS HERITAGE SIGNIFICANCE. Topic 2: PEDAGOGICAL IDEAS OF ABU NASR FORABI AND ABU ALI IBN SINO ON EDUCATION. Topic 3: EDUCATIONAL AND MORAL VIEWS OF YUSUF KHOS HAJIB, MAHMUD KASHGARI AND AHMAD YUGNAKI AND KAYKOVUS'S "QABUSNOMA" AND YOUTH EDUCATION. Topic 4: MIRZO ULUGH'BEK'S PEDAGOGICAL IDEAS AND CONTRIBUTIONS TO THE DEVELOPMENT OF EDUCATION. Topic 5: EDUCATIONAL AND MORAL VIEWS OF ABDURAHMON JOMII AND PEDAGOGICAL VIEWS OF ALISHER NAVAL. Topic 6: PEDAGOGICAL VIEWS OF NEW ENLIGHTENERS AND PEDAGOGICAL VIEWS OF ABDULLA AVLONI Topic 7: EXPRESSION OF CONCEPTUAL IDEAS ON THE SPIRITUAL AND MORAL FOUNDATIONS OF SOCIETY DEVELOPMENT AND THE FORMATION OF A HIGHLY SPIRITUAL PERSON IN THE WORKS OF THE FIRST PRESIDENT OF THE REPUBLIC OF UZBEKISTAN I.A. KARIMOV. Topic 8: PEDAGOGICAL SYSTEM OF JAN AMOS COMENIUS. PEDAGOGICAL SYSTEM OF KONSTANTIN DMITRIYEVICH USHINSKY. Topic 9 Global trends in the world education system of the 20th century. Topic 10: Ways to form pedagogical skills. The concept of communication. Topic 11: Communicative skills and pedagogical influence. Culture and psychology of communication in the work of a teacher Topic 12: The concept of tact and pedagogical tact. Conditions for using pedagogical tact. Topic 13. Pedagogical etiquette. Etiquette of behavior of a teacher. Topic 14. Pedagogical technique. Speech technique and culture. Topic 15. Self-education and work on oneself as the main condition for pedagogical skill.
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Study and examination requirements and forms of examination	The following criteria are recommended for monitoring a student's mastery of the subject: a) To receive a grade of 5, the student's level of knowledge must meet the following requirements: ☐ fully covers the essence and content of the subject; ☐ maintains scientific and logical approach to the presentation of the subject's topics, avoiding scientific errors and confusion; ☐ has a clear idea of the theoretical or practical significance of the subject materials in the subject; ☐ can demonstrate the ability to think independently within the scope of the subject; ☐ can answer the questions posed clearly and concisely; ☐ has carefully prepared the outline; ☐ has completed independent assignments completely and clearly; ☐ has fully mastered the laws and other regulatory and legal documents related to the subject; ☐ has published a scientific article on one of the topics related to the subject; ☐ can interpret historical processes; b) to receive a grade of 4, the student's level of knowledge must meet the following requirements: ☐ understands the essence and content of the subject, does not allow scientific and logical confusion in presenting the topics in the subject; ☐ understands the practical significance of the content of the subject; ☐ performs the tasks and assignments assigned to the subject within the framework of the curriculum; ☐ can answer the questions asked in the subject correctly; ☐ has carefully formulated the subject outline; ☐ has completed independent assignments in the subject; ☐ has mastered the laws and other regulatory documents related to the subject. c) To receive a grade of 3, the student's level of knowledge must meet the following requirements: ☐ has a general understanding of the subject; ☐ if the subject topics are covered in a narrow range and some confusion is allowed in the presentation; ☐ if the presentation is not smooth; ☐ if complex and confusing answers are given to questions on the subject;
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	☐ if the text on the subject is not well-formed. d) In the following cases, the student's level of knowledge may be assessed with an unsatisfactory grade of 2: ☐ if preparation for the subject exercises is not carried out; ☐ has no idea about the subject; ☐ is clearly copying the subject texts from others; ☐ has serious errors and inaccuracies in the subject text; ☐ does not answer the questions asked about the subject; ☐ does not know the subject.
Media employed	• technology for organizing interactive lectures, seminars and practical classes; • modular learning technology; • problem-based learning technology; • cooperative learning technology; • reflexive learning technology; • art technologies; • web quest; • graphic and pictorial models (logical graph, frame model, basic outline, semantic network, mind map).
Reading list	1. Ayupova M. Logopediya. Darslik.- T.: "O'zbekiston faylasuflari milliy jamiyati nashriyoti", 2007. - 560 b. 2. Abdullayeva, B.S., Xoliqov A.A., D.R. Farsaxonova va bosh. Umumiy pedagogika. Pedagogika nazariyasi, pedagogika tarixi. Darslik.- T.: 2021. -342 b. 3. Abdullayeva B.S., Xoliqov A.A., Sodiqov N.M. va bosh. Umumiy pedagogika. Pedagogik mahorat. Darslik.- T.: 2021. -204 b. 4. Akramova H. Defektologiya. Logopediya: O'quv –uslubiy qo'llanma, T.: 2021. -160 b. 5. Djamilova N, Xasanboyeva O. Pedagogika fanlarini o'qitish metodikasi; O'quv qo'llanma.-T.; 2021-180 b. 6. Berdiyeva G. Oila pedagogikasi. O'quv qo'llanma.- T.: "Voris nashriyoti", 2021. – 208 b. 7. Hasanboyev J. va bosh. Pedagogika. Pedagogika nazariyasi va tarixi. Darslik.- T: "Noshir" 2011. - 448 b. 8. Ismoilova Yu. Umumiy pedagogika O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2022.- 424 b. 9. Jalolova R.M. Pedagogik mahorat. O'quv qo'llanma.- T.: Chinor fayzi, 2022. - 312b. 10. Karimjonov A. Pedagogik tizimni boshqarish asoslari. . O'quv qo'llanma.-T.: 2008. -176 b. 11. Karaxanova O.Yu. Qiyosiy pedagogika. O'quv qo'llanma.- Qarshi: 2022. - 272 b.

	12. Karaxanova O.Yu. Pedagogik texnologiya. O'quv qo'llanma.- Qarshi davlat universiteti: 2023. - 254 b. 13. Karaxanova O.Yu. Umumiy pedagogika. O'quv qo'llanma.- Qarshi davlat universiteti: 2024. - 250 b. 14. Mamedov K.Q. va bosh. Oligofrenopedagogika asoslari. O'quv qo'llanma.- T.: "O'qituvchi", 1994 .- 168 b. 15. Musurmonova O., N.J. Isaqulova M.T.Jumaniyozova va bosh. Umumiy pedagogika. O'quv qo'llanma II-qism. T.; 2020.-194 b. 16. Muhammadiyeva M.M. Sharq uyg'onish davri pedagogik fikr taraqqiyoti: O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2021. - 132 b. 17. Murodova Z. Umumiy pedagogika (pedagogika nazariyasi). O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2022. - 328 b. 18. Muhammadiyeva M.M. Xalq pedagogikasi. Darslik. Qarshi fan va ta'lim nashriyoti 2023. -276 b. 19. Oripova N.X., Aliqulova M.Sh. Oila pedagogikasi O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2023. - 240 b. 20. Safarova R., Pedagogika. Ensiklopediya. 11-jild, O'zbekiston milliy ensiklopediyasi Davlat milliy nashriyoti.-T.: 2015. -376 b. 21. Sultonov A. Ijtimoiy pedagogika. O'quv qo'llanma.- Qarshi: 2021. - 284 b. 22. Po'latova P.M. Maxsus Pedagogika. Darslik.- T.: "G'afur G'ulom nomidagi nashriyot matbaa ijodiy uyi", 2005. -224 b. 23. Rahmonova V.S. Defektologiya va logopediya asoslari. O'quv – uslubiy qo'llanma, T.: "O'qituvchi", 1991. – 110 b. 24. Rajabova L. Kasbiy pedagogika. O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2021. - 184 b. 25. Tolipov O', Ro'ziyeva D. Pedagogik texnologiyalar va pedagogik mahorat. O'quv qo'llanma.- T.: 2021. -276 b. 26. Xudoyqulov X., Xolov O.. Tarbiyaviy ishlar metodikasi. O'quv qo'llanma.- T.: "Innovatsiya-Ziyo", 2020. – 164 b. 27. Xamidova. M.U. Maxsus pedagogika. O'quv qo'llanma.- T.: 2021. – 164 b. 28. Xodjayev B., Bozorova M., Murodova Z. va bosh. Pedagogik tadqiqotlarni modellashtirish. O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2021. - 216 b. 29. Xodjayev B.X., Begmatova S.N., Xo'jamqulov A. Umumiy pedagogika. O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2023. - 316 b. 30. Xujayarova N.S. Umumiy pedagogika (pedagogik mahorat) O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2023. - 124 b. 31. Yarmanova Yu. Maktabgacha pedagogika. O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2021. - 128 b. 32. Choriyeva F. Maktabgacha ta'limda pedagogik diagnostika. O'quv qo'llanma.- Qarshi fan va ta'lim nashriyoti 2021. - 140 b. 33. Shodiyev R. D., Pedagogik konfektologiya: Darslik.- Qarshi: "Nasaf", 2019. - 100 b. 34. Shodiyev R. D., M. Kazakova. Nasafiylarning pedagogik qarashlari: O'quv qo'llanma.- Qarshi: 2021. - 100 b. 35. Sharifzoda S.O', Yuldashev S.N., Jo'rayev A.R.va bosh. Pedagogika tarixi. O'quv qo'llanma.-T.; 2022. – 172 b.
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Reviewers	Yuldoshev Ismoil Abruyevich - Dean of the Faculty of Pedagogy, Associate Professor Oripova Nodima Khalilovna - Head of the Department of Karshi State University, Doctor of Pedagogical Sciences, Professor
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2025)

Module designation	MFT15606 Equations of Mathematical Physics
Semester(s) in which the module is taught	6 semester (credit 6)
Person is responsible for the module	Nuraliyeva Navbahor
Language	Uzbek language
Relation to curriculum	Compulsory (Core) Course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 6 ECTS (180 hours): Lectures: 46 hours Practical training 44 hours Self-Study and Independent Learning: 90 hours
Credit points	Total Credits: 6 ECTS: 6
Required and recommended prerequisites for joining the module	• Mathematical Analysis • Algebra • Theory of Functions of a Complex Variable (Complex Analysis) • Linear Algebra and Analytic Geometry • Differential Equations
Module objectives/intended learning outcomes	Upon successful completion of this module, students will be able to: • Solve both computational and theoretical problems in functional analysis, demonstrating a deep understanding of core concepts and techniques • Establish logical relationships between fundamental definitions, concepts, and theorems within functional analysis • Construct and present rigorous mathematical proofs for both classical results and newly formulated analogous statements • Apply a wide range of methods from functional analysis to investigate theoretical and applied problems • Select and combine appropriate analytical methods and techniques for solving complex mathematical tasks • Analyze and interpret abstract mathematical structures, ensuring logical consistency and mathematical rigor • Demonstrate advanced skills in critical thinking, abstraction, and mathematical reasoning
	6.
Content	• Cauchy problem for the inhomogeneous heat transfer equation

	• Solving mixed problems for one-dimensional heat transfer equation using the Fourier methods • Solving problems about harmonic functions and their properties • Inner Dirichlet and Neumann problems for the Laplace equation • Solving the Dirichlet and Neumann problems on a sphere for the Poisson and Poisson equations. • Green's function of the Dirichlet problem and the Green's function • Fourier transform of a function in one variable. • Generalized functions and their properties
Examination forms	Paper examination
Study and examination requirements	Students are required to: • Attend lectures and practical sessions regularly and actively participate in practical classes • Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving • Successfully complete all midterm assessment tasks • Achieve the minimum required score in continuous assessment to be admitted to the final examination • Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills
Reading list	1. O.S. Zikrov, <i>Matematik fizika tenglamalari. Fan va texnologiya</i>, Toshkent, 2017. 2. M.Salohiddinov., B.Islomov., <i>Matematik fizika tenglamalari.</i>, Universitet, Toshkent., 2017. 3. Salohiddinov M., <i>Matematik fizika tenglamalari: darslik.</i> — Toshkent: O'zbekiston, 2022. 4. Vector Ivrii., <i>Partial Differential Equations.</i>, Toronto, Ontario, Canada., 2026.

Module designation	1. FA136707 Functional analysis
Semester(s) in which the module is taught	6 semester (credit 2) , 7 semester (credit 5)
Person is responsible for the module	Nodirov Shohrux
Language	Uzbek language
Relation to curriculum	Compulsory (Core) Course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 6,7 ECTS (210 hours): Lectures: 44 hours Practical training 46 hours Self-Study and Independent Learning: 120 hours
Credit points	Total Credits: 7 ECTS: 6–7
Required and recommended prerequisites for joining the module	• Mathematical Analysis • Algebra • Theory of Functions of a Complex Variable (Complex Analysis) • Linear Algebra and Analytic Geometry • Differential Equations
Module objectives/intended learning outcomes	Upon successful completion of this module, students will be able to: • Solve both computational and theoretical problems in mathematical analysis, demonstrating a deep understanding of core concepts and techniques • Establish logical relationships between fundamental definitions, concepts, and theorems within mathematical analysis • Construct and present rigorous mathematical proofs for both classical results and newly formulated analogous statements • Apply a wide range of methods from mathematical analysis to investigate theoretical and applied problems • Select and combine appropriate analytical methods and techniques for solving complex mathematical tasks • Analyze and interpret abstract mathematical structures, ensuring logical consistency and mathematical rigor • Demonstrate advanced skills in critical thinking, abstraction, and mathematical reasoning
	7.
Content	☐ Sets and Operations on Sets ☐ Mappings and Cardinality of Sets

	☐ <i>Theory of Metric Spaces</i> ☐ <i>Systems of Sets: Rings, Algebras, and Semirings of Sets</i> ☐ <i>General Definition of Measure and Extension of Measures</i> ☐ <i>Measurable Functions and Their Properties</i> ☐ <i>Sequences of Measurable Functions and Types of Convergence</i> ☐ <i>Lebesgue Integral</i> ☐ <i>Limit Transitions under the Lebesgue Integral</i> ☐ <i>Monotonic Functions and Functions of Bounded Variation</i>
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>Students are required to:</i> • <i>Attend lectures and practical sessions regularly and actively participate in practical classes</i> • <i>Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving</i> • <i>Successfully complete all midterm assessment tasks</i> • <i>Achieve the minimum required score in continuous assessment to be admitted to the final examination</i> • <i>Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills</i>
Reading list	1. <i>J.I. Abdullaev, R.N. G'anixo'jayev va b. Funksional analiz, Toshkent – Samarqand, 2009.</i> 2. <i>Sh. A. Ayupov va b. Funksional analizdan misol va masalalar, Nukus "Bilim", 2009.</i> 3. <i>Yu.X. Eshqabilov va b. Funksional analiz (misol va masalalar yechish) 1-qism, Toshkent, "Tafakkur bo'stoni", 2015.</i> 4. <i>Eshqobilov Yu.X. O'lchovli to'plamlar, - Toshkent, O'zMU, 2011.</i> 5. <i>Eshqobilov Yu.X. Lebeg integrali, - Toshkent, O'zMU, "Universitet", 2012.</i> 6. <i>Eshqobilov Yu.X., G'anixo'jayev R.N. Metrik fazolar, - Toshkent, O'zMU, "Universitet", 2013.</i>

Module name:	General psychology
Code, if applicable:	UPsix1604
Semesters in which the module is taught:	6
Lecturer:	Sattarova Gulnora
Language	Uzbek
Relation to curriculum:	Compulsory

Type of teaching, contact hours:	Lecture seminar
Workload:	120 hours Contact hours: 60 hours; lecture – 30 hours; practical – 30 hours Self-study: 60 hours
Credit points:	4
Recommended prerequisites:	General pedagogy

Module objectives Intended learning outcome	The objectives of the course based on this curriculum are as follows: The aim of teaching this course is to develop students' knowledge, skills, and competencies in general psychology, including the psyche, personality, activity, communication, cognitive processes, volitional qualities, emotional states, and individual characteristics. Furthermore, the course is designed to ensure that future pedagogical specialists acquire and systematically internalize modern scientific knowledge regarding the laws, stages, mechanisms, factors, and conditions of psychological development, and are able to apply this knowledge effectively in their professional practice. ● Students will acquire knowledge and understanding of the subject, objectives, tasks, and principles of general psychology, as well as the essence of the psyche. ● They will develop an understanding of the relationship between psychology and scientific and technological progress, the nature of the psyche as a form of reflection of objective reality by living beings, the forms of psychic reflection, the relationship between psyche and consciousness, and the psychophysiological foundations of behavior, including knowledge of the nervous system and neurons. ● Students' understanding of the concepts of the individual, personality, and individuality will be expanded, along with knowledge of personal activity, experimental methods of personality research, factors influencing personality development, and the psychological structure of personality. ● They will study the role of communication in the phylogenetic and ontogenetic development of humans, as well as verbal and nonverbal means of communication. ● Their knowledge will be broadened regarding the characteristics of attention and its development, the laws governing sensation and perception, memory processes and methods of studying memory, imagination and its types, thinking and emotional cognition, intelligence, and psychological differentiation in the field of intelligence.
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	• Students will form a clear understanding of the development of higher mental functions, motivational processes, mental states, and the emotional-volitional sphere of personality, including volitional actions and their regulation. • They will develop competencies in applying theoretical knowledge about the influence of environment and education on psychological development, as well as theories of temperament, character, and abilities, and the development of abilities in practical professional activities.
Content	General Psychology – Lesson Plan Lesson 1. 4 hours (Lecture / Practical) • Subject, aim, and objectives of General Psychology • Understanding the scope and purpose of the course Lesson 2. 4 hours (Lecture / Practical) • Methods of General Psychology • Research methods in psychology; specifics of conducting scientific investigations in psychology Lesson 3. 4 hours (Lecture / Practical) • Phylogenetic development of the psyche and consciousness • Understanding the evolution of mental processes and consciousness Lesson 4. 4 hours (Lecture / Practical) • Personality • Concepts of personality, individual, and individuality Lesson 5. 4 hours (Lecture / Practical) • Concept of activity • Types of activity and their characteristics Lesson 6. 4 hours (Lecture / Practical) • Psychology of communication • The role of communication in human phylogenetic and ontogenetic development Lesson 7. 4 hours (Lecture / Practical) • Mental processes: Attention • Attention, its types and characteristics Lesson 8. 4 hours (Lecture / Practical) • Sensation • Types of sensations and the laws governing sensory processes Lesson 9. 4 hours (Lecture / Practical) • Perception • Characteristics and laws of perception

	Lesson 10. 4 hours (Lecture / Practical) • Memory and imagination • Processes of memory and imagination, and their types Lesson 11. 4 hours (Lecture / Practical) • Thinking • Forms and types of thinking Lesson 12. 4 hours (Lecture / Practical) • Emotion and volition • Emotional-volitional sphere of personality Lesson 13. 4 hours (Lecture / Practical) • Temperament • Characteristics and types of temperament Lesson 14. 4 hours (Lecture / Practical) • Character • Structure and traits of character Lesson 15. 4 hours (Lecture / Practical) • Abilities • Structure and types of abilities
Study and examination requirements and forms of examination	Oral Examination: For this exam, the student is given 20 minutes for preparation to answer the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are provided for all questions – 5 (Excellent) 2. If answers are provided for all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good) 3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not correspond to the questions – 2 (Unsatisfactory)
Media employed	Multimedia Equipment for Teaching Psychology 1. Basic Technical Equipment • Computer (desktop or laptop) • Multimedia projector • Interactive whiteboard (smart board) • Large-screen TV 2. Audio Equipment • Speakers • Microphone (wired or wireless)

	- Headphones (for individual use) 3. Video and Recording Equipment - Video camera - Webcam - Digital camera 4. Data Storage and Transfer Devices - USB flash drive - External hard drive (HDD/SSD) - CD/DVD discs (if needed) 5. Internet and Communication Tools - Wi-Fi router - Modem - Devices for accessing online platforms 6. Specialized Psychology Software and Platforms - Testing and survey software - Presentation software (e.g., PowerPoint) - Online learning platforms (e.g., Zoom, Google Meet) 7. Additional Equipment - Graphics tablet (for diagrams and experiments) - Printer and scanner - VR (Virtual Reality) devices (for advanced teaching methods)
Reading list	Main References - Mirziyoyev, Sh.M. Decree No. PF-4947 of 07.02.2017, “<i>On the Strategy of Action for the Further Development of the Republic of Uzbekistan.</i>” - Constitution of the Republic of Uzbekistan. Adopted by national referendum on April 30, 2023. - Davletshin, M.G., Toychiyeva, S.M. <i>General Psychology</i>. Tashkent: TDPU, 2002. – 202 p. - Karimova, V.M. <i>Psychology</i>. Tashkent: Sharq, 2000. – 256 p. - Ivanov, P.I., Zufarova, M.Ye. <i>General Psychology</i>. Tashkent: National Society of Philosophers of Uzbekistan, 2008. – 480 p. - Boymurodov, N. <i>Leadership Psychology</i>. Tashkent: Yangi Asr Avlodi, 2007. – 327 p. - Jalilova, S.X., Haydarov, F.I., Khalilova, N.I. <i>Occupational Psychology</i>. Tashkent: TDPU, 2010. – 127 p. - G’oziyev, E. <i>General Psychology</i>. Tashkent: Philosophers, 2010. – 541 p.

	9. Jo'rayev, B. <i>General Psychology</i> . Qarshi: Ilm, Fan va Ma'naviyat, 2024. – 295 p.
Reviewers	Reviewers B. Jo'rayev – Doctor of Psychology, Professor, Qarshi State University L. Beknazarova – Doctor of Psychology, Professor
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2025)

Module designation	MO‘M1705 Methodology of teaching mathematics
Semester(s) in which the module is taught	7-Semester
Person is responsible for the module	Abdiraxmonov Abdimumin
Language	Uzbek language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 7 ECTS (5 credits): Lectures: 30 hours Seminar: 30 hours Self-Study and Independent Learning: 90 hours
Credit points	5 (2+3)
Required and recommended prerequisites for joining the module	Mathematical analysis, Analytic Geometry, algebra, linear algebra and analytic geometry and practicum in mathematics
Module objectives/intended learning outcomes	The aim of teaching this subject to students is to familiarize them with the essential body of knowledge in mathematics teaching methodology, including concepts, theorems and their proofs, methods for solving practical problems, and more.
Content	1. Main Periods in the History of Mathematics and Their Brief Classification 2. The Subject of Mathematics Teaching Methodology and Its Historical Formation as a Science; Movement for Reforming Mathematical Education 3. Scientific Methods in Mathematics and Its Teaching 4. Forms of Thinking in Mathematics Teaching 5. Forms of Reasoning and Didactic Principles in Mathematics Teaching 6. Methods of Teaching Mathematics 7. Organizational Forms of Mathematics Instruction 8. Extracurricular Mathematics Activities and Their Methodology 9. Sets and Relations in the School Mathematics Curriculum 10. The Concept of Numbers, Computational Culture, and Basic Transformations in the School Mathematics Curriculum 10. The Concept of Functions in the School Mathematics Curriculum 11. Teaching Geometric Figures in the School Mathematics Curriculum 12. Teaching Equations and Inequalities in the School Mathematics Curriculum 13. Elements of Mathematical Analysis in the School Mathematics Curriculum

	14. Axiomatic Method in the School Mathematics Curriculum 15. Algebraic Expressions and Basic Transformations 16. Trigonometric Expressions and Basic Transformations 17. Sequences and Progressions 18. Combinatorics and the Binomial Theorem 19. Algebraic Equations and Systems of Equations 20. Logarithms 21. Exponential and Logarithmic Equations and Systems of Equations 22. Trigonometric Equations 23. Systems of Trigonometric Equations 24. Inequalities and Systems of Inequalities 25. Problems in Planimetry 26. Problems in Stereometry 27. Problems Related to Mathematical Analysis 29. Solving Problems Using Vectors and Coordinate Systems 30 Lectures and Analysis of Students' Open Lessons on Certain Topics
Examination forms	<i>Paper examination</i>
Study and examination requirements	Students are required to: • Attend lectures and practical sessions regularly and actively participate in practical classes • Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving • Successfully complete all midterm assessment tasks • Achieve the minimum required score in continuous assessment to be admitted to the final examination • Pass the final written examination by demonstrating both theoretical
Reading list	1. S.Alixonov. Matematika o'qitish metodikasi. Toshkent-2011y.(o'quv qo'llanma). Cho'lpon nomidagi nashriyot-matbaa ijodiy uyi. 2. M.Tojiev, M. Barakaev, A. Xurramov " Matematika ukitish metodikasi. T, 2017 y (ukuv kullanma) 3. A.Abdiraxmonov, A.Narmanov, N.Narmuratov "Matematika tarixi", "Fan va texnologiya" nashriyoti.Toshkent-2016. 4. Barakayev, M. Tojiyev, D. Yunusova, K. Mamadaliyev " Matematika o'qitish texnologiyalari va loyihalari. T, 2020 y 5. M. Hakimova "Matematika o'qitish metodikasi" T, 2020y.(o'quv qo'llanma) 6. Z.G.Tadjieva i drugie Metodika prepodavaniya matematiki, T.2011.

Module name:
**VARIATION CALCULATION AND OPTIMIZATION
METHODS**

Code, if applicable	VHOU17807
Tegishli kurslar (mavjud bo'lsa):	-
Semesters in which the module is taught	7,8
Lecturer	Khurramov Alisher Khasanovich, senior teacher
Language	Uzbek / English
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture, practical training
Workload	Total study load: 210 hours Communication hours: 90 hours • lecture - 44 hours • seminar - 46 hours Independent study: 120 hours
Credit points	7
Recommended prerequisites	mathematical analysis, Differential equations, Process research, Functional analysis, Physico-mathematical equations

Module objectives / intended learning outcome	- knowledge of mathematical analysis, analytical geometry, higher algebra and differential equations; the theory and methods of finding extremums (if possible, extremal values) of linear and nonlinear functions of one and more arguments; the theory and methods of finding extremums (strong and weak maxima and minima) of single and multiple integrals; - must have the skills to find appropriate methods for solving specific problems. - theoretical foundations of optimization problems in finite spaces; - principle of maximum and fundamentals of dynamic programming;
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	- the student must have the skills to apply the acquired theoretical knowledge to solve examples and problems. Permissible controls. Maximum principle for rapid tasks.
Content	Lesson 1. 2 hours (Lecture / Practical) Formulation of the main problem of variational calculus. Lesson 2. 2 hours (Lecture / Practical) Strong and weak minimums of a functional. Lesson 3. 2 hours (Lecture / Practical) Admissible curves. The essence of the variation method. Lesson 4. 2 hours (Lecture / Practical) Curve and functional variations. Variations of the first and second orders. Lesson 5. 2 hours (Lecture / Practical) In a variational problem, a weak minimum is a necessary condition. Lesson 6. 2 hours (Lecture / Practical) Lagrange's Lemma. Euler-Lagrange equation. Lesson 7. 2 hours (Lecture / Practical) Extrema of the Euler-Lagrange equation, its integrable cases. Lesson 8. 2 hours (Lecture / Practical) Strict derivation of the Du Bois-Reymond lemma and Euler's equation. Lesson 9. 2 hours (Lecture / Practical) Necessary conditions of the second order. Hilbert's condition. The concept of a non-singular extremal. Lesson 10. 2 hours (Lecture / Practical) Marking method for finding the maximum flow. The Backpack Question. Lesson 11. 2 hours (Lecture / Practical) Hilbert theorem. Minimum condition of the functional for piecewise-smooth functions. Placement of the Masachai. Weierstrass-Edmond condition. Lesson 12. 2 hours (Lecture / Practical) Legendre condition. Jacobi condition. Jacobi's differential equation. Jacobi necessary condition for a weak minimum.

	Lesson 13. 2 hours (Lecture / Practical) a necessary condition for a weak minimum for functionals dependent on n functions. Lesson 14. 2 hours (Lecture / Practical) A necessary condition for a weak minimum for a functional dependent on higher-order derivatives. Lesson 15. 2 hours (Lecture / Practical) Euler-Poisson equation. A necessary condition for a weak minimum for a functional dependent on n independent variables. Lesson 16. 2 hours (Lecture / Practical) Ostrogradsky M.V. equation. Lesson 17. 2 hours (Lecture / Practical) Variational problems in parametric form. Lesson 18. 2 hours (Lecture / Practical) Jacobi's equation. Weierstrass function. Legendre condition for a weak minimum. Lesson 19. 2 hours (Lecture / Practical) Controlled objects. On the maximum principle of L.S. Pontryagi. Lesson 20. 2 hours (Lecture / Practical) Permissible controls. Maximum principle for rapid tasks. Lesson 21. 2 hours (Lecture / Practical) Dynamic programming method. The Bellman function and its differentiability. Lesson 22. 2 hours (Lecture / Practical) Derivation of the maximum principle for speed, which is the essence of dynamic programming. Bellman's equation. Lesson 23. 2 hours (Practical) The problem of optimal control synthesis.
Study and examination requirements and forms of examination	Oral Examination: For this exam, the student is given 20 minutes for preparation to answer the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are provided for all questions – 5 (Excellent) 2. If answers are provided for all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good) 3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not correspond to the questions – 2 (Unsatisfactory)

Media employed	Completion of academic assignments and successful completion of current, interim, and final control forms
Reading list	Main literature Bertsekas, D.P. *Nonlinear Programming*. 1999. Hestenes. M.R. Calculus of Variations and Optimal Control Theory. 1980. Pontryagin, L.S. *Mathematical Theory of Optimal Processes*. 1962.
Reviewers:	Z.Kurbanov (Karshi State University, Associate Professor of the Department of "Applied Mathematics") I. Khurramov (Karshi State University, Teacher of the Department of "Applied Mathematics")
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2025)

Module designation	<i>MUMP 1804. MATHEMATICS TEACHING METHODOLOGY PRACTICE</i>
Semester(s) in which the module is taught	8 Semester
Person is responsible for the module	<i>Okbaeva Nilufar Urakovna</i>
Language	<i>Uzbek language</i>
Relation to curriculum	<i>Compulsory course</i>
Teaching methods	<i>Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.</i>
Workload (incl. contact hours, self-study hours)	<i>Total workload: 120 hours (4 ECTS) Lectures: 30 hours Practical training: 30 hours Independent study: 60 hours</i>
Credit points	<i>4 ECTS</i>
Required and recommended prerequisites for joining the module	<i>Methodology of Teaching Mathematics, Combinatorics operation, Algebra and number theory, Analytic geometry</i>
Module objectives/intended learning outcomes	<i>The subject of the mathematics teaching methodology practicum prepares students for the teaching profession by connecting the knowledge gained from the courses "Algebra and Number Theory", "Mathematical Analysis" and "Geometry" with secondary mathematics, providing students with the skills to solve problems and examples, and developing them.</i>
Content	<i>1. Division with and without remainder</i> <i>2. Prime and complex numbers</i> <i>3. Euclidean algorithm. Finding ECUB and ECUK</i> <i>4. Solving first-degree indefinite equations</i> <i>5. Numerical functions $[x]$ and $\{x\}$</i> <i>6. Systematic numbers</i> <i>7. General concepts of combinatorics</i> <i>8. Basic combinations. Permutations. Permutations. Groupings</i> <i>9. Pascal's triangle. Newton's binomial</i> <i>10. Repeated combinations</i> <i>11. Fibonacci numbers</i> <i>12. Topic. Exact substitution of entire expressions</i> <i>13. Exact substitutions in trigonometric expressions</i> <i>14. Algebraic equations and systems of equations.</i> <i>15. Trigonometric equations</i>
Examination forms	<i>Written examination</i>
Study and examination requirements	<i>It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and intermediate control, and submit a test or written work for</i>

	<i>final control.</i>
Reading list	1. S.Alixonov. Matematika o'qitish metodikasi. Toshkent-2011y.(o'quv Qo'llanma). Cho'lpon nomidagi nashriyot-matbaa ijodiy uyi. 2. M.tojiev, M. Barakaev, A. Xurramov “ matematika ukitish Metodikasi. T, 2017 y (ukuv kullanma) 3. A.abdiraxmonov, a. Narmanov, n. Narmuratov “matematika tarixi”, “fan va texnologiya” nashriyoti.toshkent-2016 4. M.Barakayev, M. Tojiyev, D. Yunusova, K. Mamadaliyev “ Matematika o'qitish texnologiyalari va loyihalari. T, 2020 y 5.M. Hakimova “Matematika o'qitish metodikasi” T, 2020y.(o'quv qo'llanma) 6._Z.G.Tadjieva i drugie Metodika prepodavaniya matematiki, T.2011.

Module designation	EMP 1804 Practicum on Elementary Mathematics
Semester(s) in which the module is taught	8 semester (cridet 4)
Person is responsible for the module	Rakhimov Abror
Language	Uzbek language
Relation to curriculum	Compulsory (Core) Course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 4 ECTS (120 hours): Lectures: 30 hours Practical training 30 hours Self-Study and Independent Learning: 60 hours
Credit points	Total Credits: 4 ECTS: 4
Required and recommended prerequisites for joining the module	• Elementary Mathematics • Trigonometry • Set Theory • Elementary Geometry
Module objectives/intended learning outcomes	Upon successful completion of this module, students will be able to:

	• Demonstrate a deep understanding of fundamental concepts and techniques in elementary mathematics, solving computational and theoretical problems • Establish logical relationships between fundamental definitions, concepts and theorems within elementary mathematics • Construct and present rigorous mathematical proofs for classical results and newly formulated similar statements • Apply a wide range of methods from elementary mathematics to the study of theoretical and practical problems • Select and combine appropriate analytical methods and techniques to solve complex mathematical problems • Analyze and interpret abstract mathematical structures, ensuring logical consistency and mathematical precision • Demonstrate advanced skills in critical thinking, abstraction and mathematical reasoning
	8.
Content	• Real numbers • Combinatorics • Identical transformations on rational and irrational expressions • Elementary functions • Algebraic equations • Algebraic inequalities • Checking functions • Identical transformations on trigonometric functions. Inverse trigonometric functions • Trigonometric equations and inequalities • Solving problems using geometric transformations • Metric relations in triangles • Circle and disk • Rectangles and polygons • Relationship of points, straight lines and planes in space • Polygons and bodies of revolution.
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>Students are required to:</i> • <i>Attend lectures and practical sessions regularly and actively participate in practical classes</i> • <i>Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving</i> • <i>Successfully complete all midterm assessment tasks</i> • <i>Achieve the minimum required score in continuous assessment to be admitted to the final examination</i> • <i>Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills</i>

Reading list	7. M.A.Mirzaahmedov, Sh.N.Ismailov va b. Algebra va analiz asoslari geometriya, I qism. Toshkent 2018. 8. M.A.Mirzaahmedov, Sh.N.Ismailov va b. Algebra va analiz asoslari geometriya, II qism. Toshkent 2018. 9. B. Xaydarov, E. Sariqov, A. Qo'chqorov. GEOMETRIYA. Umumiy o'rta ta'lim maktablarining 9-sinfi uchun darslik, Toshkent – 2019 10. Boxodir Xaydarov, Nargiza Tashtemirova, Isak Asrorov. GEOMETRIYA. 10-sinf darslik, Toshkent, 2022. 11. A.U. Abduhamidov, H .A. Nasimov, U.M. Nosirov, J. H usanov ALGEBRA VA MATEMATIK ANALIZ ASOSLARI, I qism. Toshkent – 2008. 12. A.U. Abduhamidov, H .A. Nasimov, U.M. Nosirov, J. H usanov. ALGEBRA VA MATEMATIK ANALIZ ASOSLARI, II qism. Toshkent – 2008.
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Module designation	Gas 2505 FUNDAMENTALS OF GEOMETRY
Semester(s) in which the module is taught	5-semester
Person is responsible for the module	<i>Ra'no Abdiraxmanova</i>
Language	<i>Uzbek language</i>
Relation to curriculum	<i>Optional course</i>
Teaching methods	<i>Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.</i>
Workload (incl. contact hours, self-study hours)	<i>Workload for 5 ECTS (150 hours):</i> <i>Lectures: 30hours</i> <i>Practical training 30hours</i> <i>Self-Study and Independent Learning: 90hours</i>
Credit points	5 (2+3)
Required and recommended prerequisites for joining the module	<i>Analytic Geometry, Mathematical Analysis, Mathematical Logic, Algebra, and Differential Geometry</i>
Module objectives/intended learning outcomes	<i>The aim of teaching this course is to provide students with fundamental knowledge of the basics of geometry, including concepts, propositions and their proofs, methods of solving practical problems, as well as knowledge of the theoretical foundations of geometry, and the essential background required for mastering their specialization, while introducing modern mathematical methods for solving practical problems with high quality and accuracy.</i>
Content	<i>Topics included in the course:</i> 1. <i>Introduction. About Euclid's "Elements". Euclid's axioms.</i> 2. <i>The Fifth Postulate. The discovery of Non-Euclidean geometry.</i> 3. <i>N.I. Lobachevsky and his geometry.</i> 4. <i>Axioms of elementary geometry. Group I. Axioms of incidence.</i> 5. <i>Group II. Axioms of order.</i> 6. <i>Results of Groups I and II axioms. The concept of a ray. Relative position of points.</i> 7. <i>Group III. Axioms of congruence.</i> 8. <i>Results of Groups I–III axioms.</i> 9. <i>Group IV. Axiom of continuity. Measuring segments and angles. Intersection of a line and a circle.</i> 10. <i>Results derived from Groups I–IV axioms.</i> 11. <i>Group V. Axiom of parallelism. Absolute geometry.</i> 12. <i>Similarity of triangles. Cartesian interpretation of the Euclidean geometry axiom system.</i> 13. <i>Consistency, completeness, and mutual independence of the Euclidean geometry axiom system.</i>

	14. Hilbert's axiomatics. Axiomatics in school textbooks. 15. Definition of parallelism according to Lobachevsky.
Examination forms	Paper examination
Study and examination requirements	<i>It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and intermediate control, and submit a test or written work for final control.</i>
Reading list	1. A.Ya.Narmanov, A.S.Sharipov Geometriya asoslari. T.Universitet, 2004 y. 2. N.V.Efimov. Vysshaya geometriya. 7-ye izd. M., FIZMATLIT, 2004 3. A.V.Pogorelov. Osnovaniya geometrii. M., Nauka, 1968 4. A.V.Pogorelov. Geometriya, O'rta maktablarning 7-11 sinflari uchun darslik. T. O'qituvchi, 2002. 5. O'rta maktablarning 7-11 sinflari uchun Geometriya darsliklari. 6. S.Atanasyan. Geometriya asoslari. T., 1962. 7. B.V.Kutuzov. Lobachevskiy geometriyasi va geometriya asoslari. 2.Sarimsoqov T.A. T., 1961

Module designation	EGP2505 Elementary Geometry Practicum
Semester(s) in which the module is taught	2-Semester
Person is responsible for the module	Oybek Xurramov
Language	Uzbek language
Relation to curriculum	Compulsory
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	60 hours – this is 2 ECTS credits: Practical training 30 hours Self-Study and Independent Learning: 30 hours
Credit points	2 (1+1)
Required and recommended prerequisites for joining the module	Mathematics (school course), Elementary Algebra, Elementary Geometry (basics of plane geometry and solid geometry), Fundamentals of Trigonometry, Basics of Mathematical Logic, Analytic Geometry (introductory concepts), Linear Algebra (introductory level)
Module objectives/intended learning outcomes	It consists of developing the skills and methods to visualize geometric objects clearly and to apply the necessary formulas through studying problems in elementary geometry. This knowledge is widely applied in modern branches of differential geometry and topology—such as the theory of manifolds, differential topology, homotopy, and homology—as well as in the education system.
Content	1. Similar triangles 2. Inscribed angle 3. Circles 4. Area 5. Triangles 6. Polygons 7. Locus of points 8. Geometric constructions 9. Volume 10. Sphere 11. Tetrahedron 12. Pyramid and prism 13. Locus of points and constructions 14. Vectors 15. Geometric transformations
Examination forms	Paper examination
Study and examination requirements	Theoretical Knowledge: 1. Understanding the basic concepts of elementary geometry, definitions, and the essence of theorems. 2. Memorizing formulas and methods correctly and being able to apply them. Practical Skills:

	1.Independently solving given geometric problems. 2.Accurately drawing geometric figures and analyzing their properties. 3.Choosing and applying different methods when solving problems. Analytical and Logical Thinking: 1.Being able to construct a logical sequence for solving problems. 2.Analyzing problems and justifying the results. Exam Format: 1.Solving test questions and short written problems. 2.Providing precise answers to theoretical questions and illustrating with examples.						
Reading list	1. Argunov B.I., Demidova I.N. Litvinenko V.N. Zadachnik-practicum po geometry. Moscow "Prosveshchenie" 1979. Chast I, II. (in Russian) 2. Delone B., Zhitomersky O. Zadachnik po geometry. M. Leningrad. 1949. (in Russian) 3. Zelenyak O.P. Reshenie zadach po geometrii. Moscow-St. Petersburg-Kiev. 2008. 4. Ivanov O.A. Praktikum po elementary mathematics. Algebroanalyticheskie metody. MTsNMO. 2001. 5. Ponarin Ya.P. Elementary geometry. Planimetry, preobrazovaniya ploskosti. Tom 1. M. MTsNMO. 2004 6. Ponarin Ya.P. Elementary geometry. Stereometry, preobrazovaniya prostanstva. Tom 2. M. MTsNMO. 2006 7. Ponarin Ya.P. Elementary geometry. Treugol's, tetrahedron. Tom 3. M. MTsNMO. 2009 8. Prasolov V.V. Planimetry of Zadachi. M. MTsNMO. 2006 9. Prasolov V.V. Stereometry of Zadachi. M. MTsNMO. 2016 10. Polonsky V.B., Rabinovich E.M., Yakir M.S. Uchimsya reshat zadachi po geometry. Kiev "Magistr-S" 1996.						
Module designation	Ko'phadN2505 Theory of polynomials						
Semester(s) in which the module is taught	5						
Person is responsible for the module	Shodiyev Sadulla						
Language	Uzbek language						
Relation to curriculum	Elective course						
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.						
Workload (incl. contact hours, self-study hours)	Workload for 5 ECTS (150 hours): Lectures: 30 hours Practical training 30 hours Self-Study and Independent Learning: 90 hours						
Credit points	<table><tr><td>Credits</td><td>Cr</td><td>ECTS</td></tr><tr><td>1. 5(1+1+3)</td><td>5</td><td>5</td></tr></table>	Credits	Cr	ECTS	1. 5(1+1+3)	5	5
Credits	Cr	ECTS					
1. 5(1+1+3)	5	5					

Required and recommended prerequisites for joining the module	1. <i>Mathematical analysis, Algebra, Linear Algebra and Analytic Geometry,</i>
Module objectives/intended learning outcomes	1. The purpose of the "Theory of Polynomials" course is to teach students the main concepts, theorems, and proofs of polynomial theory. It also covers methods for solving practical problems, the basics of approximate calculations, and modern mathematical techniques to solve problems accurately. This course provides essential knowledge needed for the students' specialization..
Content	☐ Introduction. Ring and field. Polynomial ring. ☐ Division with remainder in the ring $A[x]$. - Integral domain. ☐ Factorization in polynomial rings. Basic properties of divisibility. ☐ Euclidean algorithm and Euclidean ring. GCD and LCM. ☐ Factorial property (unique factorization) of Euclidean rings. ☐ Irreducible polynomials. ☐ General properties of integral domains. ☐ Partial fraction decomposition. ☐ General properties of polynomial roots. ☐ Differentiation in polynomial rings. ☐ Multiple factors. Vieta's formulas. Method of undetermined coefficients. ☐ Discriminant of a polynomial. Resultant of polynomials and its properties. ☐ Fundamental theorem on the algebraic closure of the field of complex numbers. ☐ Polynomials with real coefficients. ☐ Separation of real roots of polynomials. Sturm's theorem.
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>It is necessary to fully master the theoretical and</i>

	<i>methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and intermediate control, and submit a test or written work for final control.</i>
Reading list	<i>1.Kostrikin A.I. Vvedenie v algebru. Uchebnik M.Nauka, 1977g.</i> <i>2. Hojiev J., Faynleyb.F.S. Algebra va sonlar nazariyasi kursi. T. 2001 y.</i> <i>3. Kurosh F.G. Oliy algebra kursi. T.Ukituvchi . 1976 y</i> <i>4.Fadeev D.K.,Sominskiy I.S.Sbornik zadach po vysshey algebre. M.Nauka .1976 g.</i> <i>5. Dixon M.R., Kurdachenko L.A., Subbotin I.Ya., Algebra and Number theory. 2010. – 523 p</i>

Module designation	EMP 1804 Practicum in Elementary Mathematics
Semester(s) in which the module is taught	8 semester (credit 4)
Person is responsible for the module	Rakhimov Abror
Language	Uzbek language
Relation to curriculum	Compulsory (Core) Course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 4 ECTS (120 hours): Lectures: 30 hours Practical training 30 hours Self-Study and Independent Learning: 60 hours

Credit points	<i>Total Credits: 4</i> <i>ECTS: 4</i>
Required and recommended prerequisites for joining the module	• <i>Elementary Mathematics</i> • <i>Trigonometry</i> • <i>Set Theory</i> • <i>Elementary Geometry</i>
Module objectives/intended learning outcomes	Upon successful completion of this module, students will be able to: • Demonstrate a deep understanding of fundamental concepts and techniques in elementary mathematics, solving computational and theoretical problems • Establish logical relationships between fundamental definitions, concepts and theorems within elementary mathematics • Construct and present rigorous mathematical proofs for classical results and newly formulated similar statements • Apply a wide range of methods from elementary mathematics to the study of theoretical and practical problems • Select and combine appropriate analytical methods and techniques to solve complex mathematical problems • Analyze and interpret abstract mathematical structures, ensuring logical consistency and mathematical precision • Demonstrate advanced skills in critical thinking, abstraction and mathematical reasoning
	9.
Content	• Real numbers • Combinatorics • Identical transformations on rational and irrational expressions • Elementary functions • Algebraic equations • Algebraic inequalities • Checking functions • Identical transformations on trigonometric functions. Inverse trigonometric functions • Trigonometric equations and inequalities • Solving problems using geometric transformations • Metric relations in triangles • Circle and disk • Rectangles and polygons • Relationship of points, straight lines and planes in space • Polygons and bodies of revolution.
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>Students are required to:</i> • <i>Attend lectures and practical sessions regularly and</i>

	<i>actively participate in practical classes</i> • <i>Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving</i> • <i>Successfully complete all midterm assessment tasks</i> • <i>Achieve the minimum required score in continuous assessment to be admitted to the final examination</i> • <i>Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills</i>
Reading list	13. M.A.Mirzaahmedov, Sh.N.Ismailov va b. Algebra va analiz asoslari geometriya, I qism. Toshkent 2018. 14. M.A.Mirzaahmedov, Sh.N.Ismailov va b. Algebra va analiz asoslari geometriya, II qism. Toshkent 2018. 15. B. Xaydarov, E. Sariqov, A. Qo'chqorov. GEOMETRIYA. Umumiy o'rta ta'lim maktablarining 9-sinfi uchun darslik, Toshkent – 2019 16. Boxodir Xaydarov, Nargiza Tashtemirova, Isak Asrorov. GEOMETRIYA. 10-sinf darslik, Toshkent, 2022. 17. A.U. Abduhamidov, H .A. Nasimov, U.M. Nosirov, J. H usanov ALGEBRA VA MATEMATIK ANALIZ ASOSLARI, I qism. Toshkent – 2008. 18. A.U. Abduhamidov, H .A. Nasimov, U.M. Nosirov, J. H usanov. ALGEBRA VA MATEMATIK ANALIZ ASOSLARI, II qism. Toshkent – 2008.

Module designation	KE 125605 Elements of combinatorics
Semester(s) in which the module is taught	5-6- Semester
Person responsible for the module	Ruziboyeva Oqila Shonazar qizi
Language	Uzbek Language
Relation to curriculum	elective course
Teaching methods	Lecture, discussion, problem solving, independent study
Workload	Total workload: 150 hours (5 ECTS) Lectures: 30 hours Practical training: 30 hours Independent study: 90 hours
Credit points	5 ECTS
Required prerequisites	Methodology of Teaching Mathematics
Module objectives	• In the course of mathematics teaching methodology, students gain an idea of the scientific and psychological-pedagogical foundations of content and structure,

	methods and tools of teaching mathematics, the formation of a worldview in teaching mathematics, the laws of the development of mathematics, and the stages of development of mathematics as a science.
Content	1. General concepts of combinatorics 2. Basic combinations 3. Pascal's triangle. Newton's binomial 4. Repeated combinations 5. Fibonacci numbers 6. Combinatorics of partitions 7. Generating functions 8. Basic knowledge of graph theory 9. Methods of representation of graphs 10. Operations on graphs 11. Routes and chains 12. Euler and Hamiltonian graphs 13. Metric characteristics of graphs 14. Trees and equivalent concepts 15. The concept of networks.
Examination form	Written examination
Study and examination requirements	Students must master theoretical concepts, complete independent assignments and pass the final written exam.
Reading list	1. H. TO'RAYEV, I. AZIZOV, S. OTAQULOV "KOMBINATORIKA VA GRAFLAR NAZARIYASI" Toshkent — ILM ZIYO- 2009-y 2. V. Lipskiy. Kombinatorika dlya programmistov. M., «Mir», 1988 3. Ya.M. Yerusalimskiy. Diskretnaya matematika: teoriya, zadachi, prilozheniya. M., «Vuzovskaya kniga», 2000

Module name:	Numerical Methods
Code, if applicable:	Hus1805
Semesters in which the module is taught:	8
Lecturer:	Djabbarov O.R. Head of the Department of Applied Mathematics, Doctor of Philosophy

	(PhD) in Physical and Mathematical Sciences, Associate Professor
Language	Uzbek
Relation to curriculum:	Compulsory
Type of teaching, contact hours:	Lecture, practical
Workload:	120 hours Contact hours: 60 hours; lecture – 30 hours; practical – 30 hours Self-study: 60 hours
Credit points:	4
Recommended prerequisites:	Mathematical Analysis Differential Equations Equations of Mathematical Physics Algebra

Module objectives Intended learning outcome	Purpose of teaching the course – The purpose of teaching the course “Numerical Methods” is to equip students with skills in applying various computational methods to solve mathematical problems, to develop algorithms, to analyze the quality and efficiency of algorithms, and to acquire competencies in using numerical methods. Course objectives – The objectives of the course include: identifying the type of a given problem, selecting or developing an appropriate computational method for solving the problem, implementing algorithms, correctly applying known algorithms, determining the stability of numerical methods, using modern high-level programming languages to create programs for solving problems, solving mathematical problems using personal computers, and analyzing computational results and making decisions based on them. During the course, topics such as approximation of functions, numerical differentiation and integration, numerical methods of algebra, and approximate solutions of differential equations are studied.
Content	Mundarijasi 1. Lesson 1. 4 hours (Lecture / Practical) Introduction and errors 2. Lesson 2. 4 hours (Lecture / Practical) Nonlinear equations (Newton, bisection) 3. Lesson 3. 4 hours (Lecture / Practical) Linear systems (Gauss, iterative) 4. Lesson 4. 4 hours (Lecture / Practical)

	Interpolation (Lagrange, Newton, spline) 5. Lesson 5. 4 hours (Lecture / Practical) Numerical differentiation 6. Lesson 6. 4 hours (Lecture / Practical) Numerical integration 7. Lesson 7. 4 hours (Lecture / Practical) ODE (Euler, Runge-Kutta) 8. Lesson 8. 4 hours (Lecture / Practical) Boundary value problems 9. Lesson 9. 4 hours (Lecture / Practical) Integral equations
Study and examination requirements and forms of examination	Oral Examination: For this exam, the student is given 20 minutes for preparation to answer the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are provided for all questions – 5 (Excellent) 2. If answers are provided for all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good) 3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not correspond to the questions – 2 (Unsatisfactory)
Media employed	The teaching of the Numerical Methods module is supported by modern educational and digital technologies. The course uses multimedia tools to enhance students' understanding of numerical algorithms and computational processes. The following media and tools are employed: presentation slides (PowerPoint) for theoretical explanations; computer-based simulations and numerical experiments; mathematical software such as MATLAB, Python, and MathCAD; interactive problem-solving sessions using digital platforms; visual demonstrations of numerical methods and error analysis; online learning resources and electronic textbooks;

	programming environments for implementing numerical algorithms. The integration of these tools allows students to better understand abstract mathematical concepts, visualize numerical processes, and develop practical computational skills. The use of ICT ensures the development of analytical thinking, algorithmic reasoning, and independent problem-solving abilities. Students are encouraged to apply numerical methods in real-world problems using modern computational tools.
Reading list	Isroilov, M.I. <i>Computational Methods</i>. Part 1. Tashkent: O'qituvchi, 2003. Isroilov, M.I. <i>Computational Methods</i>. Part 2. Tashkent: O'qituvchi, 2008. Aloyev, R.D., Xudoyberganov, M.O'. <i>Laboratory Exercises for the Course "Computational Methods"</i>. Tashkent: O'zMU, 2008. 110 p. Ismatullayev, G'.P., Kosbergenova, M.S. <i>Computational Methods</i>. Tashkent: Tafakkur-bo'stoni, 2014.
Reviewers	O. Shukurov – Professor of the Department of Applied Mathematics, Doctor of Physical and Mathematical Sciences N. Eshqorayeva – Associate Professor of the Department of Applied Mathematics, Candidate of Technical Sciences
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2021)

Module designation	MT 2705 History of Mathematics
Semester(s) in which the module is taught	7 Semester
Person responsible for the module	Ruziboyeva Oqila Shonazar qizi
Language	Uzbek Language
Relation to curriculum	Compulsory course
Teaching methods	Lecture, discussion, problem solving, independent study
Workload	Total workload: 150 hours (5 ECTS) Lectures: 30 hours Practical training: 30 hours Independent study: 90 hours
Credit points	5 ECTS

Required prerequisites	Methodology of Teaching Mathematics
Module objectives	Students gain knowledge about the historical development of mathematics, the contribution of great mathematicians and the evolution of mathematical ideas.
Content	1. Program and Methodology of the History of Mathematics 2. Program and Methodology of the History of Mathematics 3. Mathematical Concepts in Ancient Peoples 4. Greek Mathematics 5. Solution of the Three Classical Problems in Greek Mathematics 6. Formation of Greek Mathematics as a Deductive Science. Euclid's <i>Elements</i> 7. Examples from the Lives and Works of Greek Mathematicians 8. Mathematics in Central Asia and the Near East during the Middle Ages 9. Examples from the Lives and Works of Medieval Central Asian Scholars 10. Mathematics of Variable Quantities 11. Differential and Integral Calculus 12. Mathematics from the Late 16th to Early 19th Century. Emergence of Various Branches of Mathematics 13. Non-Euclidean Geometry 14. Russian Mathematics in the 19th–20th Centuries 15. Examples from the Lives and Works of Contemporary Uzbek Mathematicians
Examination form	Written examination

Study and examination requirements	Students must master theoretical concepts, complete independent assignments and pass the final written exam.
Reading list	1. Abduraxmonov A., Narmonov A., Normurodov N., Matematika tarixi. "Fan va texnologiyalar" nashriyoti Toshkent-2016. 2. Axmedov S.A.O'rta Osiyoda matematika o'qitish tarixidan. T.: "O'qituvchi", 1977 3. Nazarov X., Ostonov Q., Matematika tarixi T.: "O'qituvchi", 1996 4. K.A. Рыбников. Историya matematika. Moskva.izd.MGU, 1974. 5. K.I.Gleyzer. Istoriya matematika v shkole. V 3-x chastyax. Moskva prosvechenie 1981-1983. 6. Abduraxmonov A. Algebra tarixidan. Toshkent universitet, 1996. 7. Beruniy. Tanlangan asarlar. "Qonuni Masudiy". T.: "Fan" 1975

Module designation	2. ON2705 Theory of operators
Semester(s) in which the module is taught	7 semester (credit 5)
Person is responsible for the module	Nodirov Shohrux
Language	Uzbek language
Relation to curriculum	Elective Course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 7 ECTS (150 hours): Lectures: 30 hours Practical training 30 hours Self-Study and Independent Learning: 90 hours
Credit points	Total Credits: 5 ECTS: 7
Required and recommended prerequisites for joining the module	• Mathematical Analysis • Functional analysis • Algebra • Theory of Functions of a Complex Variable (Complex Analysis) • Linear Algebra and Analytic Geometry • Differential Equations
Module objectives/intended learning outcomes	Upon successful completion of this module, students will be able to: • Solve both computational and theoretical problems in functional analysis, demonstrating a deep understanding of core concepts and techniques • Establish logical relationships between fundamental definitions, concepts, and theorems within functional analysis • Construct and present rigorous mathematical proofs for both classical results and newly formulated analogous statements • Apply a wide range of methods from functional analysis to investigate theoretical and applied problems • Select and combine appropriate analytical methods and techniques for solving complex mathematical tasks • Analyze and interpret abstract mathematical structures, ensuring logical consistency and mathematical rigor • Demonstrate advanced skills in critical thinking, abstraction, and mathematical reasoning
	10.
Content	☐ Linear spaces

	☐ <i>Linearly normalized and Banach spaces</i> ☐ <i>Euclidean spaces</i> ☐ <i>Linear continuous operators</i> ☐ <i>Linear functional in normalized spaces</i> ☐ <i>Spaces of linear continuous operators</i> ☐ <i>Inverse operators</i> ☐ <i>Joint operators</i> ☐ <i>Compact operators</i> ☐ <i>Linear integral equations</i>
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>Students are required to:</i> • <i>Attend lectures and practical sessions regularly and actively participate in practical classes</i> • <i>Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving</i> • <i>Successfully complete all midterm assessment tasks</i> • <i>Achieve the minimum required score in continuous assessment to be admitted to the final examination</i> • <i>Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills</i>
Reading list	19. J.I. Abdullaev, R.N. G'anixo'jayev va b. <i>Funksional analiz</i>, Toshkent – Samarqand, 2009. 20. Sh. A. Ayupov va b. <i>Funksional analizdan misol va masalalar</i>, Nukus “Bilim”, 2009. 21. Yu.X. Eshqabilov va b. <i>Funksional analiz (misol va masalalar yechish) 1-qism</i>, Toshkent, “Tafakkur bo'stoni”, 2015. 22. Eshqobilov Yu.X. <i>O'lchovli to'plamlar</i>, - Toshkent, O'zMU, 2011. 23. Eshqobilov Yu.X. <i>Lebeg integrali</i>, - Toshkent, O'zMU, “Universitet”, 2012. 24. Eshqobilov Yu.X., G'anixo'jayev R.N. <i>Metrik fazolar</i>, - Toshkent, O'zMU, “Universitet”, 2013.
Module designation	MOM26605 Olympiad Problems in Mathematics
Semester(s) in which the module is taught	6 semester (credit 4)
Person is responsible for the module	Nodirov Shohrux
Language	Uzbek language
Relation to curriculum	Elective course
Teaching methods	<i>Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.</i>
Workload (incl. contact hours, self-study hours)	<i>Workload for 4 ECTS (120 hours):</i> <i>Lectures: 30 hours</i> <i>Practical training 30 hours</i>

	<i>Self-Study and Independent Learning: 60 hours</i>
Credit points	<i>Total Credits: 4 ECTS: 4</i>
Required and recommended prerequisites for joining the module	• <i>Mathematical Analysis</i> • <i>Algebra</i> • <i>Theory of Functions of a Complex Variable (Complex Analysis)</i> • <i>Linear Algebra and Analytic Geometry</i> • <i>Differential Equations</i>
Module objectives/intended learning outcomes	<i>Upon successful completion of this module, students will be able to:</i> • <i>Solve both computational and theoretical problems in functional analysis, demonstrating a deep understanding of core concepts and techniques</i> • <i>Establish logical relationships between fundamental definitions, concepts, and theorems within functional analysis</i> • <i>Construct and present rigorous mathematical proofs for both classical results and newly formulated analogous statements</i> • <i>Apply a wide range of methods from functional analysis to investigate theoretical and applied problems</i> • <i>Select and combine appropriate analytical methods and techniques for solving complex mathematical tasks</i> • <i>Analyze and interpret abstract mathematical structures, ensuring logical consistency and mathematical rigor</i> • <i>Demonstrate advanced skills in critical thinking, abstraction, and mathematical reasoning</i>
	<i>11.</i>
Content	• <i>Classical Inequalities</i> • <i>Theorems on Methods of Proving Inequalities</i> • <i>Problems on Trigonometry</i> • <i>Progressions</i> • <i>Maximum and Minimum Values</i> • <i>Problems on Planimetry</i>
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>Students are required to:</i> • <i>Attend lectures and practical sessions regularly and actively participate in practical classes</i> • <i>Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving</i> • <i>Successfully complete all midterm assessment tasks</i>

	• Achieve the minimum required score in continuous assessment to be admitted to the final examination • Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills
Reading list	25. Bin Xiong. <i>Mathematical Olympiad in China (2017–2018): Problems and Solutions</i>, World Scientific / East China Normal University Press, Singapur / Xitoy, 2022 26. Volodymyr Brayman, Alexander Kukush. <i>Undergraduate Mathematics Competitions (1995–2016): Taras Shevchenko National University of Kyiv</i>, Springer, USA 2017 27. Radmila Bulajich Manfrino, José Antonio Gómez Ortega, Rogelio Valdez Delgado. <i>Topics in Algebra and Analysis: Preparing for the Mathematical Olympiad</i>, Springer, 2015 28. Titu Andreescu, Bogdan Enescu. <i>Mathematical Olympiad Treasures</i>, Birkhäuser Boston 2012 29. Corneliu Mănescu-Avram. <i>Selection Tests in Algebra for Mathematical Olympiads</i>, Springer 2024 30. H. Norjigitov, J.A. Bahramov. “<i>Matematik olimpiada masalalarini yeehish uchun qo’llanma</i>”, Guliston -2014

Module designation	MFQB2804. Additional chapters of mathematical physics
Semester(s) in which the module is taught	8-semester (cridet 4)
Person is responsible for the module	Yangiboyev Zoyir
Language	Uzbek language
Relation to curriculum	Compulsory (Core) Course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 4 ECTS (120 hours): Lectures: 30 hours Practical training 30 hours Self-Study and Independent Learning: 60 hours
Credit points	Total Credits: 4 ECTS: 4
Required and recommended prerequisites for joining the module	• Mathematical Analysis • Equations of mathematical physics • Theory of Functions of a Complex Variable (Complex Analysis) • Linear Algebra and Analytic Geometry • Differential Equations
Module objectives/intended learning outcomes	Upon successful completion of this module, students will be able to: □ Solve computational and theoretical problems in advanced topics of mathematical physics, demonstrating a deep understanding of differential equations, integral transforms, and boundary value problem techniques. □ Establish logical relationships between definitions, concepts, and theorems associated with fundamental equations of mathematical physics (such as heat conduction, wave, and Laplace equations). □ Construct and present rigorous mathematical proofs for classical boundary value problems as well as their generalized or analogous formulations. □ Apply Fourier series, Fourier and Laplace transforms, and special functions to solve both theoretical and applied problems. □ Select and integrate appropriate analytical methods and techniques for solving complex problems arising in mathematical physics. □ Analyze and interpret abstract mathematical models, justifying the existence, uniqueness, and stability of solutions. □ Demonstrate advanced skills in critical thinking, mathematical modeling, and scientific reasoning, and apply them to problems in physics and engineering.

Content	□ <i>Complete Euclidean Spaces. The Riesz–Fischer Theorem. Single Trigonometric Fourier Series.</i> □ <i>The equivalence of the concepts of completeness and closedness of orthonormal systems in a Hilbert space.</i> □ <i>Term-by-term differentiation and integration of a single trigonometric Fourier series. Uniform convergence of a single trigonometric series.</i> □ <i>The concept of a double trigonometric Fourier series. Rectangular and spherical partial sums of a double trigonometric Fourier series.</i> □ <i>Fourier transform of single-variable functions summable with the square on the set of integers.</i> □ <i>Basic and generalized functions. Change of variables in generalized functions.</i> □ <i>Regular generalized functions. Measures. Singular generalized functions.</i> □ <i>The Sokhotski formula. Change of variables in generalized functions. Multiplication by a generalized function.</i> □ <i>Differentiation of generalized functions. Generalized derivative and its properties. The primitive (antiderivative) of a generalized function. Local structure of generalized functions.</i> □ <i>Direct (pointwise) product of generalized functions. Convolution of generalized functions.</i>
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>Students are required to:</i> • <i>Attend lectures and practical sessions regularly and actively participate in practical classes</i> • <i>Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving</i> • <i>Successfully complete all midterm assessment tasks</i> • <i>Achieve the minimum required score in continuous assessment to be admitted to the final examination</i> • <i>Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills</i>
Reading list	<i>1.D.Q. Durdiyev Xususiy hosilali differensial tenglamalar, Toshkent, 2019.</i> <i>2. Sh.F. Qosimov, T.N. Aliqulov, Sh.K. Otaev, F.S. Xaitboev, M.M. Babaev, Matematik fizikaning zamonaviy usullari, o‘quv qo‘llanma 1-tom. Toshkent “Universitet” 2016.</i> <i>3. Sh.F. Qosimov, T.N. Aliqulov, Sh.K. Otaev, F.S. Xaitboev, M.M. Babaev, Matematik fizikaning zamonaviy usullari, o‘quv qo‘llanma 2-tom. Toshkent “Universitet” 2016.</i> <i>4. M. M. Karchevskiy, M. F. Pavlova. Uravneniya matematicheskoy fiziki. Dopolnitelnye glavy O‘quv qo‘llanma, Rossiya, 2015.</i>

Module designation	ENTB 2705: SELECTED CHAPTERS OF PROBABILITY THEORY
Semester(s) in which the module is taught	7-semester
Person is responsible for the module	Azam Imomov
Language	Uzbek language
Relation to curriculum	Special course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 5 ECTS (150 hours): Lectures: 30hours Practical training 30hours Self-Study and Independent Learning: 90hours
Credit points	5 (2+3)
Required and recommended prerequisites for joining the module	Mathematical Analysis, Mathematical Logic, Algebra, and Differential Geometry
Module objectives/intended learning outcomes	Today, as a result of the rapid development of modern technologies, the study of various complex processes and economic issues—including conceptualizing them from a mathematical perspective, as well as constructing and solving their models—represents a task of significant theoretical, applied, and practical importance. Modern probability theory and mathematical statistics are founded upon stochastic processes—specifically martingales, related processes, and stochastic integrals
Content	<i>Topics included in the course:</i> 1. Probability space, probability models. Axioms of probability theory. Properties of probability 2. Random variables and their types. Classical limit theorems 3. Characteristic functions and their properties. Convergence theorems 4. Types of random processes: Poisson and Wiener processes 5. Discrete-time Markov random processes. Markov chains and classification of states 6. Homogeneous chains 7. Theorems regarding states of homogeneous Markov chains 8. Limit theorems for transition probabilities of homogeneous Markov chains. Stationary measures 9. Discrete-time branching random processes: structure and properties

	<i>10. Limit theorems for discrete-time branching random processes</i>
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>It is necessary to fully master the theoretical and methodological concepts of the subject, be able to accurately reflect the results of the analysis, conduct independent observations of the processes being studied, and complete the tasks and assignments given in the forms of current and intermediate control, and submit a test or written work for final control.</i>
Reading list	1. Sh.Q.Farmonov. “Ehtimollar nazariyasi”, Toshkent, “Universitet”, 2014. 2. Боровков А.А. «Теория вероятностей», Москва, «Лань», 2010 г. Стр.705. 3. Athreya K.B., Ney P.E. Branching processes. Springer, New York, 1972. 3. Гихман И.И, Скороход А.В. Введение в теорию случайных процессов. – Москва: «Наука», 1977 г., 567 стр. 4. Розанов Ю.А. Случайные процессы. Краткий курс. – Москва: «Наука», 1979 г., 184 стр. 5. Тихонов В.И. Миронов М.А. Марковские случайные процессы. – Москва: «Наука», 1977 г.

Reviewers	Reviewers A.Imomov – Doctor of Physical and Mathematical Science, Professor, Karshi State University
Confirmed place and time	Developed and approved by Karshi State University (Report № 02. 07. 2022)

Module designation	3. O'IN2705, Theory of Measure and Integration
Semester(s) in which the module is taught	7 semester
Person is responsible for the module	Khamrayev Akhror
Language	Uzbek language
Relation to curriculum	Elective Course
Teaching methods	Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.
Workload (incl. contact hours, self-study hours)	Workload for 4 ECTS (150 hours): Lectures: 30 hours Practical training 30 hours Self-Study and Independent Learning: 90 hours
Credit points	Total Credits: 5 ECTS:
Required and recommended prerequisites for joining the module	• Mathematical Analysis • Linear Algebra and Analytic Geometry • Functional analysis • Theory of functions of a complex variable
Module objectives/intended learning outcomes	• Upon successful completion of this module, students will be able to: • Explain fundamental concepts of measure theory, including σ-algebras, measures, and measurable spaces • Construct and analyze Lebesgue measure and its key properties • Apply methods for extending measures and work with measurable and non-measurable sets • Define and investigate measurable functions and their main properties • Distinguish and analyze different types of convergence (almost everywhere, in measure, uniform) • Develop and evaluate the Lebesgue integral and apply its main properties • Apply major convergence theorems, including the Monotone Convergence Theorem and Dominated Convergence Theorem • Compare Lebesgue and Riemann integrals and justify the advantages of the Lebesgue approach • Apply product measures and use Fubini's theorem in solving multidimensional integration problems • Demonstrate strong analytical thinking and rigorous mathematical reasoning
	12.
Content	• Sets and Mappings • Systems of Sets • Lebesgue Measure in the Plane

	• <i>General Definition of Measure</i> • <i>Extension of Measures</i> • <i>Lebesgue Extension Scheme</i> • <i>Non-measurable Sets</i> • <i>Measurable Functions</i> • <i>Types of Convergence</i> • <i>Convergence in Measure</i> • <i>Simple Functions and Measurability Criteria</i> • <i>General Definition of the Lebesgue Integral</i> • <i>Limit Theorems under the Lebesgue Integral</i> • <i>Lebesgue Integral on Sets of Infinite Measure</i> • <i>Product Measures</i>
Examination forms	<i>Paper examination</i>
Study and examination requirements	<i>Students are required to:</i> • <i>Attend lectures and practical sessions regularly and actively participate in advanced discussions and problem-solving activities</i> • <i>Demonstrate a deep understanding of theoretical concepts and the ability to apply advanced methods in solving complex problems</i> • <i>Complete all coursework assignments, including problem sets and independent study tasks, at a high academic standard</i> • <i>Successfully complete midterm assessments and demonstrate consistent academic progress</i> • <i>Achieve the minimum required score in continuous assessment to be admitted to the final examination</i> • <i>Demonstrate the ability to analyze, interpret, and rigorously justify mathematical results</i> • <i>Pass the final written examination by demonstrating advanced theoretical knowledge, independent thinking, and problem-solving skills</i>
Reading list	31. Barbara D. Macluer. <i>Elementary Functional analysis</i>. Springer. 2009. 32. J.I. Abdullaev, R.N. G'anixo'jaye va b. <i>Funksional analiz</i>, Toshkent – Samarqand, 2009. 33. Sh. A. Ayupov va b. <i>Funksional analizdan misol va masalalar</i>, Nukus "Bilim", 2009 34. J.I.Abdullayev, R.N.G'anixo'jaye, M.H.Shermatov, O.I.Egamberdiyev "Funksional analiz va integral tenglamalar" Universitetlarning zika-matematika fakulteti talabalari uchun darslik. Toshkent. "EL PRESS", 2013. 458 b 35. Cohn, D.L. <i>Measure Theory</i>. Birkhäuser, 2013. 36. Tao, T. <i>An Introduction to Measure Theory</i>. American Mathematical Society, 2011. 37. Sarimsoqov T. A. <i>Haqiqiy o'zgaruvchili funksiyalar nazariyasi. T.: «O'qituvchi», 1986.</i>

Module designation	ANMY2604 Solving Non-standard Problems in Analysis
Semester(s) in which the module is taught	6- Semesters (4 Credit),
Person is responsible for the module	<i>Baratov Bakhodir</i>
Language	<i>Uzbek language</i>
Relation to curriculum	<i>Compulsory (Core) Course</i>
Teaching methods	<i>Lecture, discussion, problem solving, quizzes, peer-feedback, practice, dialog.</i>
Workload (incl. contact hours, self-study hours)	<i>Workload for ECTS (120 hours):</i> <i>Lectures: 30 hours</i> <i>Practical training 30 hours</i> <i>Self-Study and Independent Learning: 60 hours</i>
Credit points	<i>Total Credits: 4</i> <i>ECTS:</i>
Required and recommended prerequisites for joining the module	• <i>Elementary mathematics</i> • <i>Algebra</i> • <i>Geometry</i>
Module objectives/intended learning outcomes	<i>Upon successful completion of this module, students will be able to:</i> • <i>Solve both computational and theoretical problems in mathematical analysis, demonstrating a deep understanding of core concepts and techniques</i> • <i>Establish logical relationships between fundamental definitions, concepts, and theorems within mathematical analysis</i>

	• Construct and present rigorous mathematical proofs for both classical results and newly formulated analogous statements • Apply a wide range of methods from mathematical analysis to investigate theoretical and applied problems • Select and combine appropriate analytical methods and techniques for solving complex mathematical tasks • Analyze and interpret abstract mathematical structures, ensuring logical consistency and mathematical rigor Demonstrate advanced skills in critical thinking, abstraction, and mathematical reasoning
	13.
Content	1.1. Sets and operations on them. 1.2. Reflections and their types. 1.3. Sequence of numbers and its limit. 1.4. The concept of a function. Elementary functions 1.5. Derivative of a function. Rules for calculating the derivative 1.6. Higher-order derivative and differential of a function. 1.7. Basic theorems 1.8. Taylor's formula 1.9. L'Hopital's rules 1.10. The concept of an elementary function and the indefinite integral 1.11. Properties of definite integrals. Calculation of definite integrals 1.12. Surface of a plane figure and its calculation. 1.13. Arc length and its calculation. 1.14. Imperfect integrals with infinite limits. 1.15. Imperfect integrals of an unbounded function.
Examination forms	Paper examination
Study and examination requirements	Students are required to: • Attend lectures and practical sessions regularly and actively participate in practical classes • Demonstrate a thorough understanding of theoretical concepts and the ability to apply them in problem-solving • Successfully complete all midterm assessment tasks • Achieve the minimum required score in continuous assessment to be admitted to the final examination • Pass the final written examination by demonstrating both theoretical knowledge and practical problem-solving skills
Reading list	6. A.Sadullayev, H.Mansurov, G.Xudayberganov, A.Vorisov, R.G'ulomov, B.Abdullayevlarning "Matematik analiz kursidan misol va masalalar to'plami" Toshkent. 2025.

	7. Demidovich B.P. <i>Matematik tahlildan misol va masalalar to'plami: O'quv qo'llanma. Ruschadan tarjima</i> - NamDU, 2019. 8. Kolmogorov A.N, Fomin S.V. <i>Elementy teorii funktsiy i funktsionalnogo analiza</i>. M. «Nauka», 1981. 9. Trenogin V.A., Pisarevskiy B.M., Soboleva T.S. <i>Zadachi i uprajneniya po funktsionalnomu analizu</i>. Iz-vo «Nauka». M. 1984. 10. Eshqobilov Yu.X. <i>O'lchovli to'plamlar</i>, - Toshkent, O'zMU, 2011.
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Module name:	Media Literacy
Code, if applicable:	MT2802
Semesters in which the module is taught:	8
Lecturer:	Eldor Baratov
Language	Uzbek
Relation to curriculum:	Elective
Type of teaching, contact hours:	Lecture, practical
Workload:	Total - 60 Contact hours: 30 hours; lecture – 14 hours; practical – 16 hours Self-study: 30 hours
Credit points:	2
Recommended prerequisites:	Psychology History Religion

Module objectives Intended learning outcome	The aim is to substantiate the need for students to teach the subject "Media Literacy and Information Culture", analyze the concepts of media and information, understand that media and information cover all spheres of society, evaluate the media, and form knowledge and skills on the development of "Media Literacy and Information Culture" in Uzbekistan.
Content	Training format: lecture 1. The evolution of media literacy and information culture and its importance in society. The role and importance of information in

	society. The importance of media and information in the activation of citizens in the new Uzbekistan. 2. Competitive environment in the world media and information space. The role of foreign media in the media space. 3. Structure and influence of the media space. Information attacks and threats in social networks. 4. Identification and systematic study and analysis of the principle of information exchange in social networks. Culture of information dissemination in the media space. Person-oriented information: psychological, religious and cultural threats. 5. Ideological and theoretical foundations of ensuring information security. Spiritual and legal foundations of information security in Uzbekistan. 6. The emergence of the Internet and computer games. The impact of virtual games on the minds of young people. Media space and Internet capabilities. Training format: practical training 1. The evolution of media literacy and information culture and its importance in society. The role and importance of information in society. 2. The importance of media and information in the activation of citizens in the new Uzbekistan. 3. Competitive environment in the world media and information space. The role of foreign media in the media space. 4. Structure and influence of the media space. 5. Information attacks and threats in social networks. 6. Identification of the principle of information exchange in social networks and systematic research and analysis. 7. Culture of information dissemination in the media space. 8. Person-oriented information: psychological, religious and cultural threats. 9. Ideological and theoretical foundations of ensuring information security. 10. Moral and legal foundations of information security in Uzbekistan.
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	11. The emergence of the Internet and computer games. The impact of virtual games on the minds of young people. 12. Media space and Internet capabilities.
Study and examination requirements and forms of examination	a) To receive a grade of 5, the student's level of knowledge must meet the following requirements: ☐ can fully explain the essence and content of the subject; ☐ maintains scientificity and logic in presenting the topics in the subject, avoiding scientific errors and confusion; ☐ has a clear idea of the theoretical or practical significance of the subject materials in the subject; ☐ can demonstrate the ability to think independently within the scope of the subject; ☐ can answer the questions asked clearly and concisely; ☐ has carefully prepared the outline; ☐ has completed independent assignments completely and clearly; ☐ has fully mastered the laws and other regulatory and legal documents related to the discipline; ☐ has published a scientific article on one of the topics related to the discipline; ☐ can interpret historical processes; b) To receive a grade of 4, the student's level of knowledge must meet the following requirements: ☐ understands the essence and content of the subject, does not allow scientific and logical confusion in explaining the topics in the subject; ☐ understands the practical significance of the content of the subject; ☐ performs the assigned tasks and assignments within the framework of the curriculum; ☐ can correctly answer the questions asked in the subject; ☐ has carefully formulated a subject outline; ☐ has fully completed independent assignments in the subject; ☐ has mastered laws and other regulatory documents related to the subject. c) To receive a grade of 3, the student's level of knowledge must meet the following criteria: ☐ has a general understanding of the subject; ☐ covers the topics of the subject in a narrow range, with some inconsistencies in the presentation; ☐ is not fluent in the presentation; ☐ if complex and confusing answers are given to questions on the subject; ☐ if the text on the subject is not well-structured. g) In the following cases, the student's level of knowledge may be assessed as unsatisfactory with a grade of 2: ☐ if preparation for the subject exercises is not carried out; ☐ if the student has no idea about the subject exercises; ☐ if it is noticeable that the texts on the subject have been copied from others; ☐ if serious errors and confusions are made in the text on the subject; ☐ if the questions asked about the subject are not answered;

	☐ if the subject is not known.
Media employed	Some of the most effective methods of pedagogical technologies are the use of "Problem Situation", "FSMU", "Fish Skeleton", "Cluster" and "Why", "How" organizers in the educational process, presentation, brainstorming Blitz, discussion, question and answer technologies.
Reading list	1.Kostyuk K.N. Kniga v novoy medynoy srede. Elektron-uchebnik. Moskva:”Direkt-media”, 2015, 428 str. 2.Gudilina S.I. Mediaobrazovatel'naya sreda. Uchebnoe posobie.Moskva:»MPGU», 2022, 88 str. 3. Gudilina S.I. Mediyno-informatsionnaya gramotnost Uchebnoe posobie.Moskva:»Litres», 2024. 108 s. 4. Mamatova Yo. Sulaymonova S. O‘zbekiston mediata’lim taraqqiyoti yo‘lida. O‘quv qo‘llanma. Toshkent: “Extremum-press”, 2015. 94 b. 5. Muratova N., Grizl E., Mirzaxmedova. Jurnalistikada media va axborot savodxonligi. Toshkent: Baktريا press, 2019. -112 b. 6.Irnazarov K.T. va b. Hozirgi zamon jurnalistikasi. O‘quv qo‘llanma Toshkent.: «Aloqachi”, 2008. 312 b.
Reviewers	Dolanov A.E. - Associate Professor of the Department of Philosophy and Sociology, Ph.D. Boymurodov S.B. - Associate Professor of the Department of Philosophy and Sociology, Ph.D.
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2025)

Module name:	Russian language
Code, if applicable:	O‘RT1402
Semesters in which the module is taught:	8 semester
Lecturer:	Xamrayeva Malika

Language	Russian
Relation to curriculum:	Compulsory
Type of teaching, contact hours:	practical
Workload:	practical – 30 hours
Credit points:	2
Recommended prerequisites:	-

Module objectives Intended learning outcome	The acquisition of language knowledge, as well as the development and refinement of speech skills and abilities in areas relevant to learners, including academic, professional, and socio-cultural domains, taking into account the specificity of their field of study and the formation of certain aspects of the cultural component of communicative competence. The formation of a scientific and gumanitarnyy (humanistic) worldview, high moral and spiritual values, democratic culture, creative thinking, strong convictions, and socio-political engagement based on the ideas of national independence and democracy, as well as national and universal values, through the medium of the Russian language. As a result of mastering the course, a bachelor's degree student should: know (have an understanding of how to): construct a monologic statement in Russian on general language topics as well as on academic and professional subjects; express their thoughts fluently in both oral and written forms on professionally relevant topics; demonstrate command of the linguistic and speech norms of the modern Russian language within the professional field of their chosen specialty; conduct a dialogue and participate in a polylogue on a given topic; produce secondary academic texts (annotation, abstract, résumé). During the course, the students will: ☐ independently search for and utilize scientific information as a foundation for professional activity; ☐ work independently when preparing presentations, reports, and academic papers on professional topics; ☐ compose annotations and abstracts, selecting appropriate linguistic means in accordance with communicative intention and the context of communication.
Content	The subject of the sentence and its types of expression. Simple sentence. Types of sentences: declarative, interrogative, imperative. Lexical topic: Independence Day of the Republic of Uzbekistan.

	Gender of nouns. Noun as a part of speech. Singular and plural forms. Animate and inanimate nouns. Determining gender through agreement with other words. Lexical topic: Russian as a language of interethnic communication. Phonetic and orthoepic norms of the Russian language. Language norm. Rules for the use of linguistic means at a particular stage of language development. Consistency in pronunciation. Phonetics. Lexical topic: Our University. 4–5. Cases. Declension of nouns, pronouns, and ordinal numerals and their agreement. Nominative case. Lexical topic: The Moscow Kremlin. Genitive case. Forms of the genitive case in singular and plural nouns. Genitive case of personal, demonstrative, and possessive pronouns, adjectives, and numerals. Lexical topic: Moscow. Dative case. Forms of the dative case in singular and plural nouns. Dative case of pronouns, adjectives, and numerals. Lexical topic: Independent Uzbekistan – a state with a great past. Accusative case. Forms of the accusative case in singular and plural nouns. Accusative case of pronouns, adjectives, and numerals. Lexical topic: State Emblem. Instrumental case. Forms of the instrumental case in singular and plural nouns. Instrumental case of pronouns, adjectives, and numerals. Lexical topic: State Flag of the Republic of Uzbekistan. Prepositional case. Forms of nouns, pronouns, adjectives, and ordinal numerals and their agreement. Prepositions expressing place and direction. Lexical topic: Interesting Facts. Verbs: forms and government (past, present, future). Verbs of motion; aspect (perfective/imperfective). Agreement of verbs with nouns, adjectives, numerals, and pronouns. Lexical topic: I Study the Russian Language. Numerals: categories and spelling. Cardinal and ordinal numerals. Declension of numerals. Lexical topic: World Day of the Sick (February 11). Expression of spatial relations in simple and complex sentences. Adverbials of place. Prepositional constructions. Lexical topic: Mikhail Vasilyevich Lomonosov. Expression of temporal relations in simple and complex sentences. Adverbials of time. Complex sentences with subordinate clauses of time. Use of prepositions (v, pri, vo vremya, v techenie, na protyazhenii, v xode, v protsesse, do, pered, cherez, posle). Lexical topic: Avicenna – the first famous physician.
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	Expression of purpose relations in simple and complex sentences. Adverbials of purpose. Infinitive constructions. Subordinate clauses of purpose. Lexical topic: Education in Uzbekistan. Expression of subject–predicate and object (complement) relations in simple and complex sentences. Direct and indirect objects. Transitive and intransitive verbs. Lexical topic: Stories about Alisher Navoi. Expression of attributive relations in simple and complex sentences. Attributes: <i>soglasovannyye i nesoglasovannyye</i> (agreeing and non-agreeing modifiers). Declension of adjectives. Lexical topic: Maslenitsa Traditions. Expression of cause-and-effect relations in simple and complex sentences. Participial constructions. Subordinate clauses of cause. Lexical topic: Abu Rayhan Beruni. Expression of connection, comparison, contrast, and opposition. Coordinated sentence structures. Comparative degree of adjectives and adverbs. Lexical topic: Olympic Games. Achievements of Uzbek Athletes. Expression of conditional and concessive relations in simple and complex sentences. Real condition. Subordinate concessive clauses. Lexical topic: Language as the most important means of communication. Pronouns. Declension of pronouns: personal, possessive, negative, indefinite, determinative, demonstrative. Lexical topic: Culture of Communication. Adverbs. Spelling of adverbs. Types of adverbs (qualitative and pronominal). Lexical topic: Native Language – My Pride and Glory. Description of a person, object, and space. Portrait and characterization in literary and conversational styles. Lexical topic: What is Oil? Lexical relations: polysemy, synonyms, antonyms, homonyms, paronyms. Phraseological units. Lexical topic: Navruz – a National Holiday. 25–26. Verbs of motion with prefixes. One-directional and multi-directional movement. Usage with prepositions. Lexical topic: Women’s Day. Official-business style. Legislative, administrative, and diplomatic substyles. Formal documents: autobiography, reference, power of attorney, receipt, application. Lexical topic: Ruler of Happy Constellations.
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	Literary (fictional) style. Functions of literary language. Stylistic devices (e.g., simile). Lexical topic: A.S. Pushkin – the Greatest Russian Poet. Scientific style: lexical, morphological, and syntactic features. Lexical topic: Monument to Amir Temur. Language means and conventions for writing annotation, abstract, and review. Structure of academic texts. Lexical topic: Bukhara – the Pearl of the East.
Study and examination requirements and forms of examination	Oral Examination: For this exam, the student is given 20 minutes for preparation to answer the questions. The answers to the questions are graded as follows: 1. If detailed and complete answers are provided for all questions – 5 (Excellent) 2. If answers are provided for all questions (some of them partially) or complete answers are given for 2/3 of the questions – 4 (Good) 3. If answers are given to some of the questions or partial answers are provided for 2/3 of the questions – 3 (Satisfactory) 4. If no answers are provided or the answers do not correspond to the questions – 2 (Unsatisfactory)
Media employed	The knowledge, qualifications, and skills acquired by students in the Russian language are based on the priority objectives defined in the Resolution of the President of the Republic of Uzbekistan No. PQ-5117 dated May 19, 2021, “On measures to bring the activities of popularizing foreign language learning in the Republic of Uzbekistan to a qualitatively new level,” aimed at raising students’ proficiency in the Russian language to the C1 level. The course is designed to develop the four core language skills—reading, listening, writing, and speaking—in an integrated manner, enhance communicative competence in various contexts, deepen both practical and theoretical knowledge of the Russian language, and ensure that students are able to effectively apply their acquired knowledge, skills, and competencies in real-life situations. The objective of the course is to equip students with the necessary language skills, in accordance with internationally recognized standards, to achieve a B1–B2 level of proficiency in the Russian language through an integrated approach, and to foster their communicative competence. In accordance with the rating system used to assess students’ knowledge, skills, and competencies, mastery of the subject is

	evaluated on a point-based scale. Students' performance throughout the semester is graded on a scale from 1 to 5, including: • midterm assessment (grades 3–5); • final assessment (grades 3–5).
Reading list	Main Literature 1. Rozental, D. E., Golub, I. B., & Telenkova, M. A. <i>Modern Russian Language</i>. Moscow: Rol'f, 2003. 448 p. Additional Literature 1. <i>Constitution of the Republic of Uzbekistan</i>, April 30, 2023. 2. Mirziyoyev, Sh. M. Decree of the President of the Republic of Uzbekistan "On the Strategy of Actions for the Further Development of the Republic of Uzbekistan for 2017–2021". // <i>Narodnoye Slovo</i>, February 8, 2017, No. 28. 3. Isakova, R. K. <i>Textbook on the Russian Language (for Independent Study)</i>. National University of Uzbekistan, Tashkent, 2017; Bulgakova, L. N., Zakharenko, I. V., Krasnykh, V. V. <i>My Friends – Cases</i>. Moscow: Russian Language, 2011. 4. Kamilova, M. G., et al. <i>Manual for Teaching the Russian Language</i>. Tashkent, 2009. 5. <i>Practical Course of the Russian Language</i> (ed. by Z. S. Tashtemirova). Tashkent, 2004. 6. Ahmedova, M. Kh. <i>Russian Language (Information Technology Specialization)</i>. Textbook. Tashkent University of Information Technologies, 2016. 7. Ermchenkova, V. S. <i>To Listen and to Hear: A Guide to Listening Comprehension</i>. St. Petersburg: Zlatoust, 2010. 8. <i>Methodological Manuals on the Language of the Specialty</i>. Tashkent: University, 2019. Information Resources 1. <i>Russian Encyclopedia. Alphabet</i>. Moscow, 2007 (electronic video materials). 2. http://ziyonet.uz/ru/library 3. http://ek.nuu.uz/ 4. e-mail: kursy@online.ru (teaching materials) 5. www.gramota.ru

Reviewers	Saidova N.Z. – Lecturer, Department of Russian Language and Literature Supervisor: Sadinova D.U. Reviewers: Pardaeva D.R. – Associate Professor, Department of Russian Language and Literature, PhD Buranova Zh.A. – Associate Professor, Department of Russian Language and Literature
Confirmed place and time	Developed and approved by Karshi State University (Report № 1 02. 09. 2025)