APPROVED
Vice Rector for Academic Affairs

A.A. Voronov

Work program of the course (training module)

course:	English Language. Modern Combinatorics/Английский язык. Комбинаторика
major:	Photonics and Optical Informatics
specialization:	Photonics, Quantum Technologies & 2D Materials/Фотоника, квантовые технологии и двумерные материалы
	Landau Phystech-School of Physics & Research
	Foreign Languages Department
term:	1
qualification:	Master

Semesters, forms of interim assessment:

        1 (fall) - Pass/fail exam

        2 (spring) - Grading test

Academic hours: 120 AH in total, including:
    lectures: 0 AH.
    seminars: 120 AH.
    laboratory practical: 0 AH.

Independent work: 60 AH.

In total: 180 AH, credits in total: 4

Number of course papers, tasks: 4

Authors of the program:

    E.G. Korneeva, candidate of philological sciences, senior professor
    O.V. Shadrina, senior professor
    E.A. Musorina, senior methodologist

The program was discussed at the Foreign Languages Department 23.06.2023

Annotation
The program aims to create a holistic view of modern combinatorics, a branch of mathematics that studies combinatorial structures and investigates various ways of combining and arranging objects in order to solve problems related to the number of possible combinations and arrangements; reveals the main features of communication on topics such as graph theory, coding theory, optimization and many other areas of mathematics and science and aims to build knowledge of the specifics and patterns of verbal and written intercourse

1. Study objective

Purpose of the course

Study of the history of mathematics; development of master's students' foreign language competence for successful interaction in the field of the studied science, ability to correctly interpret specific manifestations of communicative behavior in different situations of professional context; practical skills and abilities in communicating oral and written discourse; development of creative and analytical thinking for the implementation of projects in the field of mathematics and computer science; refraction of English language skills to the study and application of knowledge in a specific field of mathematics and computer science; development of the skills of master's students in the field of mathematics and computer science

Tasks of the course

To develop the learner's ability to solve communicative tasks in various situations of professional and general cultural interaction by linguistic means, to carry out interpersonal and professional communication in a foreign language taking into account the peculiarities of the culture of the studied language, as well as the ability to overcome intercultural differences in situations of social and professional communication; to develop the ability to accumulate subject knowledge and operate them in foreign-language communication; to expand the knowledge and skills of the learner in the foreign language.

2. List of the planned results of the course (training module), correlated with the planned results of the mastering the educational program

Mastering the discipline is aimed at the formation of the following competencies:

Code and the name of the competence	Competency indicators
UC-1 Use a systematic approach to critically analyze a problem and develop an action plan	UC-1.1 Systematically analyze the problem situation, identify its components and the relations between them
	UC-1.2 Search for solutions by using available sources
	UC-1.3 Develop a step-by-step strategy for achieving a goal, foresee the result of each step, evaluate the overall impact on the planned activity and its participants
UC-2 Manage all stages of a research project	UC-2.1 Set an objective within a defined scientific problem; formulate the agenda, relevance, significance (scientific, practical, methodological, or other depending on the project type), forecast the expected results and possible areas of their application
	UC-2.2 Forecast the project outcomes, plan necessary steps to achieve the outcomes, chart the project schedule and monitoring plan
	UC-2.3 Organize and coordinate the work of project stakeholders, provide the team with necessary resources
	UC-2.4 Publicly present the project results (or results of its stages) via reports, articles, presentations at scientific conferences, seminars, and similar events
UC-3 Organize and manage a team and develop the team strategy to achieve the objectives	UC-3.1 Organize and coordinate the work of the project stakeholders and help resolve disputes and conflicts
	UC-3.2 Consider the interests, specific behavior, and diversity of opinions of team members/colleagues/counterparties

the team strategy to achieve the objectives	UC-3.3 Foresee the results (consequences) of both individual and collective actions
	UC-3.4 Plan teamwork, distribute tasks to team members, hold discussions of different ideas and opinions
UC-4 Use modern communication tools in the academic and professional fields, including those in a foreign language	UC-4.1 Exchange business information in oral and written forms in Russian and at least one foreign language
	UC-4.2 Use the acquired skills to write, translate, and edit various academic texts (abstracts, essays, reviews, articles, etc.)
	UC-4.3 Present the results of academic and professional activities in various academic events, including international conferences
	UC-4.4 Use modern ICT tools for academic and professional collaboration
UC-5 Analyze and consider cultural diversity in intercultural interactions	UC-5.1 Identify specific philosophical and scientific traditions in major world cultures
	UC-5.2 Define the theoretical and practical significance of cultural and linguistic factors within various interrelated philosophical and scientific traditions
UC-6 Determine priorities and ways to improve performance through self-assessment	UC-6.1 Achieve personal growth and professional development, determine priorities and ways to improve performance
	UC-6.2 Evaluate performance results in correlation with the set objectives and applied methods

3. List of the planned results of the course (training module)

As a result of studying the course the student should:

know:

- the relationship, mutual influence and interaction of language and culture;
- the role of language as an organic part of culture in human life, behavior and communication with speakers of other languages and other cultures, national identity and identity of peoples;
- an idea of cultural and anthropological view of person, their way of life, ideas, views, customs, value system, perception of the world - their own and others';
- the influence of culture through language on human behavior, his worldview and life in general;
- the history of emergence , stages of development and methods of teaching intercultural communication;
- the content of the concept of "culture", its role in the communication process, as well as its relation to such concepts as "socialization", "enculturation", "acculturation", "assimilation", "behavior", "language", "identity", "global citizenship";
- the influence of various social transformations on the change of cultural identity;
- peculiarities of perception of other cultures, causes of prejudices and stereotypes in intercultural interaction;
- mechanisms of formation of intercultural tolerance and dialog of cultures;
- types, kinds, forms, models, structural components of intercultural communication;
- norms and styles of intercultural communication;
- mental peculiarities and national customs of representatives of different cultures, cultural standards of ethnic, political and economic plan;
- the linguistic picture of the world of speakers of a foreign language culture, the peculiarities of their worldview and understanding of the world;
- ethical and moral norms of behavior in a foreign cultural environment;
- language norms of oral communication culture, ethical and moral norms of behavior accepted in the country of the studied language; stereotypes and ways to overcome them; etiquette norms of the countries of the studied language;
- methods of systematic and critical analysis; methods of developing an action strategy for identifying and solving a problem situation;
- stages of the project life cycle; stages of project development and realization; methods of project development and management;
- methods of team building; methods of effective team leadership; basic leadership theories and leadership styles;
- rules and regularities of personal and business oral and written communication; modern communicative technologies in Russian and foreign languages; existing professional communities for professional interaction;
- regularities and peculiarities of socio-historical development of different cultures; peculiarities of intercultural diversity of society; rules and technologies of effective intercultural interaction;
- methods of self-assessment, self-control and self-development.

be able to:

- apply methods of studying cultural systems and intercultural situations;
- perceive, analyze, interpret and compare cultural facts;
- determine the role of basic cultural concepts in intercultural communication;
- find adequate solutions in various situations of intercultural communication;
- analyze the peculiarities of intercultural communication in a team;
- reflect the orientation system of one's own culture;
- recognize and correctly interpret non-verbal signals in the process of intercultural communication;
- compose a communicative portrait of a representative of a different linguoculture;
- reveal the meaning of concepts and actions in an intercultural situation;
- analyze coincidences and differences in communicative behavior from the perspective of the cultures in contact;
- adequately realize their communicative intention in communication with representatives of other linguocultures;
- switch when meeting with another culture to other not only linguistic but also non-linguistic norms of behavior;
- identify the causes of communicative failures and apply ways of overcoming them;
- take the position of a partner in intercultural communication and identify a possible conflict as conditioned by the values and norms of his/her culture;
- successfully overcome barriers and conflicts in communication and reach mutual understanding;
- reveal the interrelation and mutual influence of language and culture;
- show tolerance to the representatives of other cultures and languages;
- analyze the main stages and regularities of the historical development of society to form a civic position;
- respect and cherish historical heritage and cultural traditions;
- use models of social situations, typical scenarios of interaction between participants of intercultural communication;
- be guided by the principles of cultural relativism and ethical norms, which imply the rejection of ethnocentrism and respect for the uniqueness of foreign-language culture and value orientations of foreign-language society;
- overcome the influence of stereotypes and carry out intercultural dialog in general and professional spheres of communication;
- model possible situations of communication between representatives of different cultures and societies;
- apply methods of systematic approach and critical analysis of problem situations; develop a strategy of action, make concrete decisions for its realization;
- develop a project taking into account the analysis of alternative variants of its implementation, define target stages, main directions of work; explain the goals and formulate tasks related to the preparation and implementation of the project; manage the project at all stages of its life cycle;
- develop a plan of group and organizational communications in preparation and implementation of the project; formulate tasks for team members to achieve the set goal; develop a team strategy); apply effective styles of team leadership to achieve the set goal;
- to apply in practice communicative technologies, methods and ways of business communication for academic and professional interaction;
- determine the theoretical and practical significance of the cultural and linguistic factor in the interaction of different philosophical and scientific traditions;
- understand and tolerantly perceive the intercultural diversity of society; analyze and take into account the diversity of cultures in the process of intercultural interaction;
- to solve the problems of personal and professional development, to determine and realize priorities of improving one's own activity; to apply methods of self-assessment and self-control.

master:

- norms of etiquette and behavior when communicating with representatives of a foreign language culture;
- principles of tolerance in resolving intercultural contradictions;
- methods of communicative research, the ability to apply the acquired knowledge in research activities, oral and written communication;
- communicative strategies and tactics characteristic of other cultures;
- skills of correct intercultural communication, independent analysis of intercultural conflicts in the process of communication with representatives of other cultures and ways to resolve them;
- norms of etiquette and behavior when communicating with representatives of a foreign language culture;
- principles of tolerance in resolving intercultural contradictions;
- methods of communicative research, ability to apply the acquired knowledge in research activities, oral and written communication;
- communicative strategies and tactics characteristic of other cultures;
- skills of correct intercultural communication, independent analysis of intercultural conflicts in the process of communication with representatives of other cultures and ways of their resolution;
- skills of correct interpretation of specific manifestations of verbal and non-verbal communicative behavior in different cultures;
- communication skills in oral and written forms in Russian and foreign languages to solve problems of interpersonal and intercultural interaction;
- skills of activity with orientation on ethical and moral norms of behavior accepted in a foreign cultural society;
- the necessary interactive and contextual knowledge to overcome the influence of stereotypes and adapt to changing conditions in contact with representatives of different cultures;
- methodology of systematic and critical analysis of problem situations; methods of setting a goal, determining ways to achieve it, and developing strategies of action;
- methods of project development and management; methods of assessing the need for resources and project efficiency;
- the ability to analyze, design and organize interpersonal, group and organizational communications in a team to achieve the goal; methods of organization and team management;
- methods of interpersonal business communication in Russian and foreign languages, using professional language forms, means and modern communication technologies;
- methods and skills of effective intercultural interaction;
- technologies and skills to manage and improve their cognitive activity on the basis of self-assessment, self-control and principles of self-education throughout life.

4. Content of the course (training module), structured by topics (sections), indicating the number of allocated academic hours and types of training sessions

4.1. The sections of the course (training module) and the complexity of the types of training sessions

№	Topic (section) of the course	Types of training sessions, including independent work			
		Lectures	Seminars	Laboratory practical	Independent work
1	1. Topic 1. Mathematics as a science		20		10
2	Topic 2: Scientific discoveries and achievements in mathematics and computer science		20		10
3	Topic 3: Fundamentals of Combinatorics		20		10
4	4. Topic4: Combinatorics and graph theory		20		10
5	Topic 5: Scope of combinatorics		20		10
6	6. Topic 6: Derivative functions		20		10
AH in total			120		60
Exam preparation	0 AH.				

Total complexity	180 AH., credits in total 4

4.2.   Content of the course (training module), structured by topics (sections)

Semester: 1 (Fall)

1. 1. Topic 1. Mathematics as a science

History of development of mathematics as a science. Outstanding scientists and fundamental discoveries. Connection of mathematics with other sciences. Basic arithmetic operations. The concept of number. History of numbers. Numerical systems. Axioms. Logic and proofs. Definitions. Variety of theories.

Communicative tasks: to reason about the development of mathematics as a science; to make reports on outstanding discoveries in mathematics and computer science; to participate in a role-playing game on the theme "Outstanding mathematicians of different epochs"; to exchange opinions on the relationship between mathematics and other sciences; to participate in debates on the theme of the discovery or invention of mathematics; to operate with basic mathematical concepts; to analyze different number systems; to participate in a conversation on the theme of the evolution of number as a basic mathematical component.

2. Topic 2: Scientific discoveries and achievements in mathematics and computer science

Scientific and technological revolution. The contradictory nature of scientific and technological progress. Development of information technologies. Natural sciences in the second half of XX - early XXI century. New approaches to explaining the world. Game theory of John von Neumann. Jordaan's theory of sets. Theory of algorithms. Graphical processing units (GPUs). Machine learning stored procedure in databases (PL/Python).

Communicative tasks: to participate in a discussion on the topic of scientific and technological revolution; to build logical statements about the contradictions of scientific and technological progress; to tell about scientific discoveries in the field of mathematics and computer science; to analyze new approaches to explaining the world; to search for necessary information on the topic; to find and offer a combinatorial problem for the group to solve.

3. Topic 3: Fundamentals of Combinatorics

History of combinatorics. Possible and impossible in combinatorics. Basic concepts of combinatorics. Permutation. Enumeration of combinations. The concept of factorial. Binomial coefficient. Partitioning problems. Formulas. Placements. Principle of inclusion and exclusion. Pigeonhole principle.

Communicative tasks: discuss and operate with the basic concepts of combinatorics; solve cases/problems on combinatorics of different types and explain their solution; in small groups exchange opinions about the possibility of applying one or another approach when solving combinatorial problems; express a reasoned opinion when solving a logic puzzle on the example of TED Talk Riddles; summarize the main ideas of a scientific article.

Semester: 2 (Spring)

4. 4. Topic4: Combinatorics and graph theory

Basic concepts of graph theory. Eulerian graphs. Hamiltonian graphs. Shortest paths. Trees. Planar graphs. Coloring of graphs. Dimensions of graphs. Combinatorial objects and methods of combining and permutation. Network theory, connectivity, optimization.

Communicative tasks: participate in a conversation on graph theory, give a proof of theorems on graph theory, describe the construction of the Eulerian cycle; in small groups discuss and propose a solution to the letter carrier's problem for different types of graphs; formulate in combinatorial terms problems related to discrete objects; apply basic algorithms of discrete optimization; speak out about possible ways of decoding ciphers, solving other problems of information theory.

5. Topic 5: Scope of combinatorics

Relation of combinatorics to other sciences. Game theory. Probability theory. Cryptography. Complexity analysis of various algorithms. Statistical physics. Number of combinations. Sets. Formation of ordered sets.

Communicative tasks: discuss solutions to typical combinatorial problems; participate in brainstorming and make an oral report on the topic "Scope of Combinatorics"; exchange opinions on the possibility of expanding the scope of combinatorics; in small groups discuss the cultural value of combinatorics in different countries of the world and present their point of view to the group; participate in a role-play on solving combinatorial problems in everyday life; compare combinatorial methods used in various industries, identify and discuss in small groups

6. 6. Topic 6: Derivative functions

Fibonacci numbers, definition and notation. Golden Ratio. Catalan numbers, recurrence and explicit formulas. Applications: correct bracket sequences, number of triangulations of a convex polygon, number of ways to connect points on a circle by non-intersecting chords.

Communicative tasks: to explain in an argumentative manner the significance of Fibonacci numbers and the golden section in various spheres of human life (cybernetics, computer science, engineering, architecture, art, biology); to participate in the discussion of the topic; to formulate questions on the essence of the discussed problem.

5. Description of the material and technical facilities that are necessary for the implementation of the educational process of the course (training module)

Classroom for conducting training sessions provided by the program of the discipline (module), with necessary equipment and technical means of training: interactive whiteboard (screen), multimedia projector, sound-reproducing equipment, computer for the teacher, with the possibility of connecting to the Internet and providing access to the electronic information and educational environment of MIPT.

6. List of the main and additional literature, that is necessary for the course (training module) mastering

Main literature

1. Английский язык для естественно-научных направлений / Л. В. Полубиченко, Е. Э. Кожарская, Н. Л. Моргун, Л. Н. Шевырдяева. – Москва: Юрайт, 2022.

2. Английский язык для академических целей / Т. А. Барановская, А. В. Захарова, Т. Б. Поспелова, Ю. А. Суворова. – Москва: Юрайт, 2022.

3. Английский язык. Грамматика (B2) / В. А. Гуреев. – Москва: Юрайт, 2022.

4. Английский язык для публичных выступлений (B1-B2) / Л. С. Чикилева. – Москва: Юрайт, 2022.

Additional literature

1. Академическое письмо. Лексика. Developing Academic Literacy / В. В. Меняйло, Н. А. Тулякова, С. В. Чумилкин. – Москва: Юрайт, 2022.

2. Английский язык для технических вузов / Г. В. Шевцова, Л. Е. Москалец. – Москва: Флинта, 2018.

Рекомендуемые литературные источники для самостоятельного изучения

1. Roberts, F. S., & Tesman, B. (2009). Applied combinatorics. CRC.

2. Seife, C. (2000b). Zero: The biography of a dangerous idea. Penguin.

3. Poundstone, W. (1993). Prisoner's dilemma: John von Neumann, game theory, and the puzzle of the bomb. Anchor Books.

4. Spaniel, W. (2015). Game theory 101: The complete textbook. wydawca nieznany.

7. List of web resources that are necessary for the course (training module) mastering

1. lms.mipt.ru – виртуальная обучающая среда   LMS МФТИ для обеспечения образовательного процесса с применением электронного обучения (далее – ЭО) и дистанционных образовательных технологий (далее – ДОТ).
2. https://www.quantamagazine.org/ - дополнительные тексты для чтения
3. https://www.ams.org/publicoutreach/mathmoments/mm145-making-beautiful-mathematics-podcast - видео и подкасты
4. https://www.math-dictionary.com/ - онлайн-словарь математических терминов
5. http://ted.com – сайт с видео-отрывками, которые магистранты смотрят в качестве домашнего задания
6. https://www.maa.org/press/periodicals/mathematics-magazine - дополнительные тексты для чтения
7. https://www.mdpi.com/journal/mca - дополнительные тексты для чтения
8. 5. Grammarly – бесплатный онлайн-сервис на основе искусственного интеллекта для помощи в написании текстов на английском языке (https://www.grammarly.com/)
9. Reverso - веб-сайт, специализирующийся на автоматизированном переводе и помощи в изучении языка. Сайт предлагает онлайн-словари, перевод в контексте, проверку орфографии, поиск синонимов и средства грамматического спряжения (https://context.reverso.net)
10. Linguee — онлайн-словарь и система контекстуального поиска переводов, позволяющая найти, как слова и фразы переводились людьми в существующих билингвистических текстах (https://www.linguee.ru/)
11. Ludwig.guru - лингвистическая поисковая система, которая проверяет грамматику, синтаксис, стилистику и последовательность предложений на английском языке (https://ludwig.guru/)
12. Quizlet - сервис для быстрого создания тестов, которые помогут запомнить любой материал разными способами (на слух, написание и т.д.) (https://quizlet.com/ru)
13. 10. Glossary maker – сервис для создания списка лексических единиц по уровню сложности, включая определения, синонимы, антонимы, производные слова и др. https://www.wordsmyth.net/

8. List of information technologies used for implementation of the educational process, including a list of software and information reference systems (if necessary)

Multimedia technologies are used in practical classes: multimedia presentations, work on the interactive whiteboard, use of Internet information resources.

Independent work of students is carried out using a virtual learning environment based on LMS Moodle (http://moodle.phystech.edu), through which students are given access to various sources of multimedia information, organized communication of all participants of the educational process, interactive control and self-control of tasks, testing.

9. Guidelines for students to master the course

The student, mastering the discipline (module) "English Language. Cobinatorics" must master the intercultural communicative competence, which includes: linguistic competence (the ability to correctly construct grammatical forms and syntactic constructions in accordance with the norms of the studied language), sociolinguistic competence (the ability to use and transform language forms in accordance with the situation of foreign language communication), sociocultural competence (the ability to take into account in communication speech and non-speech behavior adopted in the country of the studied language), sociolinguistic competence (ability to use and transform language forms in accordance with the situation of foreign language communication), sociocultural competence (ability to take into account in communication the speech and non-speech behavior adopted in the country of the studied language), social competence (ability to interact with communication partners, possession of appropriate strategies), discursive competence (ability to understand and achieve coherence of individual statements in meaningful communicative patterns), strategic competence (ability to understand and achieve coherence of individual statements in meaningful communicative patterns), strategic competence (ability to understand and achieve coherence of individual statements in meaningful communicative patterns). discursive competence (the ability to understand and achieve coherence of individual utterances in meaningful communicative patterns), strategic competence (the ability to use the most effective strategies in solving communicative tasks), subject matter competence (knowledge of subject matter information when organizing one's own utterance or understanding the utterances of others), pragmatic competence (the ability to communicate and the ability to implement any utterance taking into account the conditions under which the act of speaking (listening, writing, writing, etc.) is carried out.

The mastering of the discipline takes place in practical classes and in the independent work of the student. In practical classes the main attention is paid to the formation of skills of receptive and productive types of speech activity, which are realized both in the classroom and on the platform of virtual learning environment "Moodle" in the conditions of self-control, peer control and peer assessment by students, as well as remote control by the teacher.

Practical classes are conducted on the basis of a communicative approach using active/interactive forms of work:

- small group work;

- discussion;

- educational games (role-playing, problem role-playing, business games, etc.);

- heuristic conversation;

- viewing and discussing the video material;

- presentations based on modern multimedia.

Successful mastering of the program of discipline (module) as a whole and the effectiveness of each practical lesson directly depend on the regular independent work of the student. Assignments for independent work should be carried out by the student in full and in the specified time. Independent work includes:

- repetition and consolidation of the studied material;

- completing lexico-grammatical exercises aimed at the formation of language skills;

- reading and checking comprehension of texts;

- listening to audio recordings and watching video materials, performing tasks for them;

- performance of creative writing tasks aimed at the formation of speech skills;

- preparation of monologic and dialogic statements on the topic under study.

Management and current control of independent work is carried out in a virtual learning environment on the platform "Moodle". If there are questions or difficulties, the student can contact the teacher, using information and communication resources of the remote platform.

Current control on the discipline is carried out at each practical training in oral and written forms. The object of current control is the level of formation of language skills and speech abilities.

Assessment funds for course (training module)

major:	Photonics and Optical Informatics
specialization:	Photonics, Quantum Technologies & 2D Materials/Фотоника, квантовые технологии и двумерные материалы
	Landau Phystech-School of Physics & Research
	Foreign Languages Department
term:	1
qualification:	Master

Semesters, forms of interim assessment:

        1 (fall) - Pass/fail exam

        2 (spring) - Grading test

Authors:

E.G. Korneeva, candidate of philological sciences, senior professor

O.V. Shadrina, senior professor

E.A. Musorina, senior methodologist

1. Competencies formed during the process of studying the course

Code and the name of the competence	Competency indicators
UC-1 Use a systematic approach to critically analyze a problem and develop an action plan	UC-1.1 Systematically analyze the problem situation, identify its components and the relations between them
	UC-1.2 Search for solutions by using available sources
	UC-1.3 Develop a step-by-step strategy for achieving a goal, foresee the result of each step, evaluate the overall impact on the planned activity and its participants
UC-2 Manage all stages of a research project	UC-2.1 Set an objective within a defined scientific problem; formulate the agenda, relevance, significance (scientific, practical, methodological, or other depending on the project type), forecast the expected results and possible areas of their application
	UC-2.2 Forecast the project outcomes, plan necessary steps to achieve the outcomes, chart the project schedule and monitoring plan
	UC-2.3 Organize and coordinate the work of project stakeholders, provide the team with necessary resources
	UC-2.4 Publicly present the project results (or results of its stages) via reports, articles, presentations at scientific conferences, seminars, and similar events
UC-3 Organize and manage a team and develop the team strategy to achieve the objectives	UC-3.1 Organize and coordinate the work of the project stakeholders and help resolve disputes and conflicts
	UC-3.2 Consider the interests, specific behavior, and diversity of opinions of team members/colleagues/counterparties
	UC-3.3 Foresee the results (consequences) of both individual and collective actions
	UC-3.4 Plan teamwork, distribute tasks to team members, hold discussions of different ideas and opinions
UC-4 Use modern communication tools in the academic and professional fields, including those in a foreign language	UC-4.1 Exchange business information in oral and written forms in Russian and at least one foreign language
	UC-4.2 Use the acquired skills to write, translate, and edit various academic texts (abstracts, essays, reviews, articles, etc.)
	UC-4.3 Present the results of academic and professional activities in various academic events, including international conferences
	UC-4.4 Use modern ICT tools for academic and professional collaboration
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	UC-5.2 Define the theoretical and practical significance of cultural and linguistic factors within various interrelated philosophical and scientific traditions
UC-6 Determine priorities and ways to improve performance through self-assessment	UC-6.1 Achieve personal growth and professional development, determine priorities and ways to improve performance
	UC-6.2 Evaluate performance results in correlation with the set objectives and applied methods

2. Competency assessment indicators

As a result of studying the course the student should:

know:

- the relationship, mutual influence and interaction of language and culture;
- the role of language as an organic part of culture in human life, behavior and communication with speakers of other languages and other cultures, national identity and identity of peoples;
- an idea of cultural and anthropological view of person, their way of life, ideas, views, customs, value system, perception of the world - their own and others';
- the influence of culture through language on human behavior, his worldview and life in general;
- the history of emergence , stages of development and methods of teaching intercultural communication;
- the content of the concept of "culture", its role in the communication process, as well as its relation to such concepts as "socialization", "enculturation", "acculturation", "assimilation", "behavior", "language", "identity", "global citizenship";
- the influence of various social transformations on the change of cultural identity;
- peculiarities of perception of other cultures, causes of prejudices and stereotypes in intercultural interaction;
- mechanisms of formation of intercultural tolerance and dialog of cultures;
- types, kinds, forms, models, structural components of intercultural communication;
- norms and styles of intercultural communication;
- mental peculiarities and national customs of representatives of different cultures, cultural standards of ethnic, political and economic plan;
- the linguistic picture of the world of speakers of a foreign language culture, the peculiarities of their worldview and understanding of the world;
- ethical and moral norms of behavior in a foreign cultural environment;
- language norms of oral communication culture, ethical and moral norms of behavior accepted in the country of the studied language; stereotypes and ways to overcome them; etiquette norms of the countries of the studied language;
- methods of systematic and critical analysis; methods of developing an action strategy for identifying and solving a problem situation;
- stages of the project life cycle; stages of project development and realization; methods of project development and management;
- methods of team building; methods of effective team leadership; basic leadership theories and leadership styles;
- rules and regularities of personal and business oral and written communication; modern communicative technologies in Russian and foreign languages; existing professional communities for professional interaction;
- regularities and peculiarities of socio-historical development of different cultures; peculiarities of intercultural diversity of society; rules and technologies of effective intercultural interaction;
- methods of self-assessment, self-control and self-development.

be able to:

- apply methods of studying cultural systems and intercultural situations;
- perceive, analyze, interpret and compare cultural facts;
- determine the role of basic cultural concepts in intercultural communication;
- find adequate solutions in various situations of intercultural communication;
- analyze the peculiarities of intercultural communication in a team;
- reflect the orientation system of one's own culture;
- recognize and correctly interpret non-verbal signals in the process of intercultural communication;
- compose a communicative portrait of a representative of a different linguoculture;
- reveal the meaning of concepts and actions in an intercultural situation;
- analyze coincidences and differences in communicative behavior from the perspective of the cultures in contact;
- adequately realize their communicative intention in communication with representatives of other linguocultures;
- switch when meeting with another culture to other not only linguistic but also non-linguistic norms of behavior;
- identify the causes of communicative failures and apply ways of overcoming them;
- take the position of a partner in intercultural communication and identify a possible conflict as conditioned by the values and norms of his/her culture;
- successfully overcome barriers and conflicts in communication and reach mutual understanding;
- reveal the interrelation and mutual influence of language and culture;
- show tolerance to the representatives of other cultures and languages;
- analyze the main stages and regularities of the historical development of society to form a civic position;
- respect and cherish historical heritage and cultural traditions;
- use models of social situations, typical scenarios of interaction between participants of intercultural communication;
- be guided by the principles of cultural relativism and ethical norms, which imply the rejection of ethnocentrism and respect for the uniqueness of foreign-language culture and value orientations of foreign-language society;
- overcome the influence of stereotypes and carry out intercultural dialog in general and professional spheres of communication;
- model possible situations of communication between representatives of different cultures and societies;
- apply methods of systematic approach and critical analysis of problem situations; develop a strategy of action, make concrete decisions for its realization;
- develop a project taking into account the analysis of alternative variants of its implementation, define target stages, main directions of work; explain the goals and formulate tasks related to the preparation and implementation of the project; manage the project at all stages of its life cycle;
- develop a plan of group and organizational communications in preparation and implementation of the project; formulate tasks for team members to achieve the set goal; develop a team strategy); apply effective styles of team leadership to achieve the set goal;
- to apply in practice communicative technologies, methods and ways of business communication for academic and professional interaction;
- determine the theoretical and practical significance of the cultural and linguistic factor in the interaction of different philosophical and scientific traditions;
- understand and tolerantly perceive the intercultural diversity of society; analyze and take into account the diversity of cultures in the process of intercultural interaction;
- to solve the problems of personal and professional development, to determine and realize priorities of improving one's own activity; to apply methods of self-assessment and self-control.

master:

- norms of etiquette and behavior when communicating with representatives of a foreign language culture;
- principles of tolerance in resolving intercultural contradictions;
- methods of communicative research, the ability to apply the acquired knowledge in research activities, oral and written communication;
- communicative strategies and tactics characteristic of other cultures;
- skills of correct intercultural communication, independent analysis of intercultural conflicts in the process of communication with representatives of other cultures and ways to resolve them;
- norms of etiquette and behavior when communicating with representatives of a foreign language culture;
- principles of tolerance in resolving intercultural contradictions;
- methods of communicative research, ability to apply the acquired knowledge in research activities, oral and written communication;
- communicative strategies and tactics characteristic of other cultures;
- skills of correct intercultural communication, independent analysis of intercultural conflicts in the process of communication with representatives of other cultures and ways of their resolution;
- skills of correct interpretation of specific manifestations of verbal and non-verbal communicative behavior in different cultures;
- communication skills in oral and written forms in Russian and foreign languages to solve problems of interpersonal and intercultural interaction;
- skills of activity with orientation on ethical and moral norms of behavior accepted in a foreign cultural society;
- the necessary interactive and contextual knowledge to overcome the influence of stereotypes and adapt to changing conditions in contact with representatives of different cultures;
- methodology of systematic and critical analysis of problem situations; methods of setting a goal, determining ways to achieve it, and developing strategies of action;
- methods of project development and management; methods of assessing the need for resources and project efficiency;
- the ability to analyze, design and organize interpersonal, group and organizational communications in a team to achieve the goal; methods of organization and team management;
- methods of interpersonal business communication in Russian and foreign languages, using professional language forms, means and modern communication technologies;
- methods and skills of effective intercultural interaction;
- technologies and skills to manage and improve their cognitive activity on the basis of self-assessment, self-control and principles of self-education throughout life.

3. List of typical control tasks used to evaluate knowledge and skills

Представлено в прикреплённом файле.

4. Evaluation criteria

Представлено в прикреплённом файле.

Оценка знаний, умений, владений, характеризующая этапы формирования компетенций по дисциплине «Английский язык. Комбинаторика», проводится в форме текущего и промежуточного контроля, осуществляемого с помощью балльно-рейтинговой системы (БРС) МФТИ.

Оценка успешности освоения материала по дисциплине выражается в 100-балльной шкале и складывается из оценки качества текущей работы в семестре (80 баллов) и рейтинговой оценки за промежуточную аттестацию в конце семестра (20 баллов).

5. Methodological materials defining the procedures for the assessment of knowledge, skills, abilities and/or experience

Оценка за текущую работу в семестре выставляется как средневзвешенный балл по результатам трех балльно-рейтинговых аттестаций в течение семестра.

Текущий контроль успеваемости проводится в течение семестра с целью контроля усвоения у обучающихся знаний, умений и уровня владения иностранным языком для решения коммуникативных задач в социокультурной, академической и профессионально-деловой сферах деятельности, своевременного выявления сложностей при освоении дисциплины (модуля) и их устранению, а также оказания своевременной консультативной индивидуальной помощи обучающимся.

К контролю текущей успеваемости относятся проверка знаний, умений и владений:

– на занятиях (опросы, интерактивные беседы, доклады, презентации, ролевые игры, выполнение контрольных заданий по разным видам речевой деятельности и тестов для проверки лексико-грамматических навыков);

– по результатам индивидуальной самостоятельной работы (подготовка устных докладов, выполнение тренировочных онлайн-тестов и заданий для контроля и самоконтроля умений аудирования, чтения, письма и лексико-грамматических навыков в LMS МФТИ.

– в ходе индивидуальных консультаций с обучающимися, имеющими академические задолженности.

Промежуточная аттестация (зачет/дифференцированный зачет) проводится в устной и письменной форме по окончанию каждого семестра с целью выявления соответствия уровня сформированности компетенций по дисциплине(модулю) требованиям образовательного стандарта МФТИ по направлению подготовки в объеме рабочей программы. Оценка за зачет/ дифференцированный зачет составляет 20% от общей оценки за семестр.

Письменная работа при промежуточной аттестации проводится в форме теста. Оценка выставляется путем сложения баллов, полученных обучающимися за все задания, и вычисления отношения набранных баллов к максимально возможному количеству баллов за письменную работу.

Устная часть зачета/ дифференцированного зачета/экзамена принимается преподавателем, не ведущим занятий в данной группе. Оценка выставляется на основе критериев оценивания монологического/диалогического высказывания. В итоговой оценке за устную и письменную часть зачета с равным весом учитываются умения по всем видам речевой деятельности: аудированию, чтению, говорению, письму.

Промежуточная аттестация по завершению освоения дисциплины(модуля) проводится в 9 семестре в форме зачета и в 10 семестре в форме дифференцированного зачета, каждый из них состоит из 2 частей: устная форма (чтение/говорение/аудирование/ перевод) и письменной форме: письменная работа, тестирование на определение уровня сформированности языковой компетенции (английский язык), для решения коммуникативных задач в социокультурной, академической и профессионально-деловой сферах деятельности, а также для развития профессиональных и личностных качеств обучающихся.

Итоговый рейтинг за семестр при освоении дисциплины (модуля) или курса обучения (курс по выбору) составляет максимум 100 баллов и формируется как сумма баллов, состоящая из следующих компонентов:

Текущий рейтинг (баллы по результатам текущего контроля успеваемости в семестре) – максимум 80 баллов, в том числе:

5 % – посещаемость занятий (0 – 4 балла);

15 % – академическая активность на учебных занятиях (0 – 12 баллов);

60 % – рубежи текущего контроля (контрольные точки) (0 – 48 баллов);

20 % – выполнение письменных работ за семестр (0 – 16 баллов), в том числе:

10 %текущее практическое задание (0 –8 баллов);

10 % итоговое практическое задание (0 – 8 баллов).

Промежуточная аттестация (зачет, дифференцированный зачет, экзамен) – 20 баллов в том числе:

50 % – на устную часть (0 – 10 баллов);

50 % – на письменную часть (0 – 10 баллов).

Рейтинговые баллы, составляющие текущий рейтинг, фиксируются педагогическим работником ДИЯ в электронном журнале. В течение учебного семестра по каждой дисциплине (модулю) обучающимся должен быть накоплен текущий рейтинг не менее 48 рейтинговых баллов (60 % от максимального значения текущего рейтинга).

Все виды учебных работ должны выполняться точно в сроки, предусмотренные программой обучения.

4. List of typical (exemplary) questions and topics for interim certification of students on the results of training

Intermediate certification of the discipline (module) "Modern Combinatorics" is held at the end of each semester.

1 semester (A1-A2) - credit: test; presentation

Written part - test
Oral part - presentation on one of the semester topics.

Examples of assignments for the written part of the credit.

1. Put questions to the underlined words.
1. <u>They</u> have just finished the research.
2. <u>Over 1,000</u> people took part in the survey.
3. It takes him <u>ten minutes</u> to get to the university.
4. Most calculations were done <u>in their lab</u>.
5. She was talking to <u>her supervisor</u>.

2. Complete the sentences with 'some', 'any', 'no', 'much', 'many' or 'a lot of''.
1. Which pencil do you like best? You may choose _____ colour you like.
2. I can't make you white tea – unfortunately, there is _____ milk left.
3. Could you lend me _____money till the day after tomorrow? I don't need much.
4. Our department has put _____effort into developing this project. We all have worked hard.
5. How _____application forms have been submitted?
6. How _____money does he owe you?

3. Put the verbs either in Present Simple, Past Simple, Present Perfect (Active or Passive).
1. He is a famous lecturer and _____(invite) to give his talks at many universities.
2. What _____ (he/think) of our new project?
3. She _____(translate) only part of the chapter so far.
4. These phenomena _____ (not explain) so far.
5. He _____(write) this book when he was a very young man.
6. This month the lectures on discreet math _____(give) in room 335.
7. She _____(work) as a researcher in our laboratory for almost ten years.
8. When exactly _____(the papers/submit) yesterday?
9. Over centuries, a lot of mathematicians _____ (inspire) by Pierre de Fermat's works.
10. The post (deliver) yet.
11. This year she _____ (do) a lot of work in this field.

5. Fill in the gaps with English equivalents of the Russian words in brackets.
1. They were asked to (перечислять) the factors that had influenced their choice.
2. After six (последовательный) defeats, the team was almost ready to give up.
3. Physics used to be very much a male (область (сфера).
4. The school has decided to adopt a different (подход) to discipline.
5. The first part of the plan has been safely (завершать).
6. If you are a student, you can (опускать) questions 16–18.
7. Licenses are only granted under the most (строгий) conditions.
8. Teachers should be (использовать) computers in education.

9. (подразумеваемый) in his speech was the assumption that they were guilty.
10. His resignation was (предшествовать) by weeks of speculation.

6. Fill in the gaps with suitable prepositions.
1. Women make _____56% of the student numbers.
2. The term 'accent 'refers _____ pronunciation.
3. He made a very positive contribution _____the success of the project.
4. Coursework is taken _____ account as well as exam results.
5. The novel's success gave rise _____a number of sequels.
6. We started sequence (*) with n = 0 so the formula above is valid _____ n equal_____ 2 or greater, and F0 = 0 and F1 = 1.

2 semester (A2-B1) - differentiated credit: test and presentation on one of the topics of the semester.
Written part - test and written abstract of a scientific article
Oral part - presentation on one of the semester topics.

Examples of assignments for the written part of the credit.

1. Fill in the gaps with suitable verb forms to make the Zero, First, Second or Third Conditionals or complex sentences with time clauses. Use contractions in negatives.

1. If Rachel _____(be) more familiar with the concept of matroid theory, she could have solved challenging problems in optimization and algorithmic complexity.
2. You could solve challenging problems in optimization and algorithmic complexity if you _____ (be) more familiar with the concept of matroid theory,
3. If you had attended a summer school on combinatorics at a different university, you _____ (learn) new techniques in combinatorial design and coding theory.
4. If you _____(prove) a long-standing conjecture in graph theory, you will be awarded a prestigious prize for excellence in combinatorics.
5. If you _____(know) how to use the quadratic formula, you can solve quadratic equations.
6. If you were exposed to more research in enumerative combinatorics, you _____ better (prepare) to tackle challenges in graph theory and combinatorial optimization.
7. You can solve problems involving derivatives and integrals if you _____(understand) the concept of limits,
8. If you prove a long-standing conjecture in graph theory, you _____(award) a prestigious prize for excellence in combinatorics.
9. If Michael had a better grasp of the relationship between graph theory and theoretical computer science, he _____(design) faster algorithms for optimization problems.
10. You will be recognized as a leading researcher in this field of mathematics if you _____(develop) an innovative approach for tackling the Ramsey theory.

2. Fill in the gaps with either the Present Perfect, Present Perfect Continuous, Past Perfect or Past Perfect Continuous Tenses. Use contractions.

1. Do you know Clara? She (be) our secretary for almost five years.
2. When he arrived at the station, he remembered that he (not switch) off his office computer.
3. She (have) an awful headache since yesterday's evening.
4. How many letters (Bob/send) to our clients so far?
5. By the time I arrived, they (already discuss) all the details of the contract.
6. Since when (you/know) the results of the test?

3. Fill in the gaps with English equivalents of the Russian words in brackets.

1. He felt (поочерёдно) hot and cold.
2. He has his own (своеобразный) style which you'll soon get used to.
3. His book on social policy proved to be (основополагающий).
4. There is no need to (утверждать) the obvious.
5. The truth of his (предположение, гипотеза) was confirmed by the newspaper report.
6. The full (осуществление, выполнение) of the system will take some time.
7. People were evacuated from the coastal regions (заранее) of the hurricane.
8. His achievements have (превосходить) expectations.
9. I had (точный) the same problem as you when I first started.
10. An attempt was made to standardize the (метод).

4. Fill in the gaps with suitable prepositions.

1. These letters stand _____ the nucleotides adenine (A), thymine (T), guanine (G) and cytosine (C) (uracil, U, replaces thymine in RNA).
2. This is the category devoted _____ discrete mathematics in relation to computer science.
3. They all use the fact that one is dealing _____ a finite point set in an ingenious way.
4. Erdös made this conjecture, apparently unaware _____Sylvester's earlier question.
5. An example of such a problem is due _____ the English mathematician James Joseph Sylvester.
6. It allows _____ bins to be shipped off quickly
7. So far we have alluded _____only a few applications of bin packing
8. The simplest way to carry _____this idea is known as First Fit.
9. Less strange perhaps is to form the infinite string shown below based _____the entries of the Fibonacci word sequence.

Criteria for evaluation of tasks of interim certification by modules

Interim certification (credit/differential credit) is held in oral and written form at the end of each semester to determine the compliance of the level of competence in the discipline (module) to the requirements of the MIPT educational standard for the direction of training in the scope of the working program. Assessment for credit/differential credit is 20% of the total grade for the semester.

Written work for interim certification is conducted in the form of a test. Assessment is made by adding the points received by students for all tasks, and calculating the ratio of points to the maximum possible number of points for written work.

The oral part of the credit/differential credit/exam is taken by a teacher who does not teach in the given group. The grade is given on the basis of the criteria for evaluating a monologic/dialogic statement. In the final grade for the oral and written part of the test, equal weight is given to the skills in all types of speech activity: listening, reading, speaking and writing.

Intermediate certification on completion of the discipline (module) is held in the 1st semester in the form of credit and in the 2nd semester in the form of differentiated credit, each of them consists of 2 parts: oral form (reading / speaking / listening / translation) and written form: written work, testing to determine the level of language competence (English), to solve communicative problems in socio-cultural, academic and professional-business spheres of activity, as well as for the development of professional and personal qualities of the student.

Assessment criteria for interim certification

Grade	Points	Criteria
Excellent	10	Grade "excellent (10)" is assigned to the student who received 96-100 points in the rating system of assessment.
	9	Grade "excellent (9)" is assigned to the student who received 91-95 points in the rating system of assessment.
	8	Grade "excellent (8)" is assigned to the student who received 86-90 points in the rating system of assessment.
Good	7	Grade "good (7)" is assigned to the student who received 81-85 points in the rating system of assessment.
	6	Grade "good (6)" is assigned to the student who received 76-80 points in the rating system of assessment.
	5	Grade "good (5)" is assigned to the student who received 71-75 points in the rating system of assessment.
Satisfactory	4	Grade "satisfactory (4)" is assigned to the student who received 66-70 points in the rating system of assessment.
	3	Grade "satisfactory (3)" is assigned to the student who received 60-65 points in the rating system of assessment.
Unsatisfactory	2	Grade of "unsatisfactory (2)" is assigned to the student who received 48-59 points in the rating system of assessment.
Unsatisfactory	1	Grade "unsatisfactory (1)" is assigned to the student who received 0-47 points in the rating system of assessment.

Criteria for assessing written abstracts
(Written Summary Assessment Criteria)
Maximum number of points - 10

Content	The presentation corresponds to the topic of the article; the style of speech is chosen correctly taking into account the purpose of the statement (academic style, objective manner of presentation); the volume of the text - 150 - 120 words.	Max 2
	The presentation corresponds to the topic of the article; some important details of the original article can be omitted (not more than 1); some violations of the style of speech (not more than 1); the volume of the text is 120 -100 words.	1,5
	The presentation mainly corresponds to the topic of the article; some important details of the original article are omitted (1-2); some violations of the style of speech (no more than 2); the volume of the text is 100 - 80 words.	1
	The presentation mainly corresponds to the topic of the article; important details of the original article can be omitted (more than 2); there are violations of the style of speech (more than 2); the volume of the text - 80 - 60 words.	0,5
	The presentation does not correspond to the topic of the article; the text length is less than 60 words.	0
Structure: cohesion, coherence	The presentation is logical and complete; there is an opening sentence that identifies the main topic or idea of the article (thesis statement); means of logical connection (linkers) are used effectively (at least 2).	Max 2
	The presentation is generally logical and complete, BUT there are 1-2 logical errors in the sequence of presentation AND/OR there are 1-2 deficiencies in the use of means of logical connection (insufficient or excessive use of means of logical connection).	1,5
	There are errors in the logic of the presentation (1-2) OR the presentation is incomplete AND/OR there are 2-3 deficiencies in the use of logical connectors (insufficient or excessive use of logical connectors).	1
	There are serious violations in the logic of the presentation (not more than 3); the presentation is incomplete AND/OR there are more than 3 deficiencies in the use of logical connection (incorrect, insufficient or excessive use of logical connection).	0,5
	There are serious violations in the logic of the presentation (more than 3); the presentation is incomplete.	0
Grammar	The grammatical structures used are appropriate to the task; there are no grammatical errors.	Max 2
	The grammatical structures used are appropriate to the task at hand; there are virtually no errors (no more than 1 minor grammatical error is allowed).	1,5

	The grammatical structures used are mostly appropriate to the task; there are a number of grammatical errors that do not hinder the understanding of the text (no more than 2).	1
	Numerous elementary level errors are made, or errors are few (no more than 4) but make it difficult to understand the text.	0,5
	Gross grammatical errors (more than 4) significantly hinder the understanding of the text.	0
Lexis	The vocabulary used corresponds to the task The vocabulary used corresponds to the task, but there may be some inaccuracies in the use of words or semantic agreement (1-2); the narration is productive, paraphrase is used.	Max 2
	The vocabulary used generally corresponds to the task set The vocabulary used generally corresponds to the task, but there are individual inaccuracies in the use of words or semantic agreement (no more than 3), or the vocabulary is limited, but the vocabulary is used correctly; more than 80% is productive.	1,5
	Limited vocabulary is used; there are irregularities in the use of vocabulary that may complicate understanding of the text (no more than 4); more than 50% of the answer is unproductive (i.e. textually coincides with the original article).	1
	Unreasonably limited vocabulary is used; there are violations in the use of vocabulary that may complicate the understanding of the text (no more than 5); more than 30% of the answer is unproductive (i.e. textually coincides with the original article).	0,5
	Limited vocabulary and numerous lexical errors (more than 5) make it impossible to accomplish the task.	0
Spelling and punctuation	There are no spelling errors. The text is divided into sentences with correct punctuation.	Max 2
	There is a number of spelling AND/OR punctuation errors (not more than 2). errors (no more than 2).	1
	There are a number of spelling AND/OR punctuation errors (no more than 4).	0,5
	There are numerous spelling and punctuation errors (more than 4).	0

Assessment table and presentation evaluation descriptors
The maximum number of points is 20

Structure (6)			Visuals (3)		Language (5)		Voice	Eye contact	Time keeping	Dealing with questions	Portfolio	Total
Who, What, Why, How	Linking words / signposts	Signalling, Summury, Conclusion, CR	Design	Work with slides	Grammar Vocab	pronunciation						
2	2	2	2	1	3	2	2	1	1	1	1	20

Signposts + linkers*: 1 point for an introductory phrase at the beginning of each paragraph; 1 point for 2 linkers in each body paragraph (0,5 +0,5)

	Clarification	Assessment criteria
STRUCTURE		
Who/Why/ What/How	At the start of the presentation: Who is the presenter? Why are we all here (the topic of the presentation and its relevance to the audience)? Why has the speaker chosen the topic or why does he/she believe it is of interest to the audience? What is the talk about (plan)? How is the talk organized (time limit, question policy)?	0.5 points are awarded for the presence of each item
Signposts and linkers	There should be signposting between parts of the presentation to indicate the beginning (or end) of each part. Each paragraph of the main body of the presentation should have at least two linkers at the beginning of sentences.	The maximum mark (2) is awarded if there are signposts between all parts of the presentation and at least two linking words at the beginning of sentences in each paragraph of the main body. 0.5 points will be deducted if there is no signposting at the transition to any part of the presentation and there are not enough linking words.

Signalling/Summary/Conclusion/CR	At the end of the presentation: Signal (indicating approaching the end of the talk) Summary (a brief overview of what has been said) Conclusion (a call for action; a recommendation; an assuarance of the audience that they're better informed). Closing remarks (thanking the audience, asking for questions).	1 point is awarded for the presence of each item.
VISUALS		
Design	Presentation slides should be designed according to the Slide Design Rules.	The maximum score (2) is awarded if all requirements for slide design are met. 0.5 points are deducted if: 1) any slide from the list of mandatory slides (for example, Title, Plan, Summary or a slide from the main content of the presentation) is missing. 2) one of the rules of graphic design of slides is violated.
Work with slides	The assessment of slide work takes into account: 1) timely switching of slides corresponding to the oral presentation 2) pointing out important information directly on the slides (with a pointer) in order to draw the audience's attention and better understand the speaker (especially if the slides contain graphic information, diagrams, drawings, etc.). 3) correct body position (ideally, on the right side of the slide with the pointer in the left hand and facing the audience) without covering the information on the slide with your body or turning your back to the audience.	The maximum score (1) is given if all the requirements for working with slides are met. 0.5 points are deducted if the student tells the text of the presentation without switching slides and/or does not indicate directly on the slides (with a pointer) important information for understanding, or turns his back to the audience (thus covering the slides).
LANGUAGE		

Grammar/ Vocabulary (presentation + Q&A)	When assessing grammar and vocabulary, consideration is given to: 1) correct use of grammatical constructions studied in the course program 2) variety of vocabulary (correct choice of words, lexical combination)	The maximum score (3) is awarded if the student makes no errors in the use of the studied grammatical constructions and lexical units. 2 points - if the student makes lexical and/or grammatical errors that do not distort the overall meaning of the statement. 1 point - if the student makes grammatical and/or lexical errors that lead to a slight distortion of the meaning of the statement. 0.5 points - if the student makes grammatical and/or lexical errors leading to a significant distortion of the meaning of the statement.
Pronunciation	In assessing pronunciation, consideration is given to: 1) pronunciation of individual words (correct pronunciation of terms); 2) correct use of intonation contour (lowering of tone at the end of narrative and negative sentences, as well as special questions; raising of tone in general questions; appropriate raising of tone in enumerations).	The maximum score (2) is awarded if the student makes no mistakes in pronouncing words and uses the intonation contour correctly. 0.5 points are deducted if any requirement is not met (the score for this criterion cannot be less than 0.5 points).
Voice	The following parameters are considered when evaluating the Voice criterion: 1) loudness; 2) expressiveness (division of sentences into semantic groups, correct use of logical emphasis, absence of monotony) 3) pace of speech: at least 125 words per minute. When answering, the student should not use the text of the presentation. Only the outline or notes! In case of non-compliance with this requirement, the student is awarded 0 points for the presentation.	The maximum score (1) is awarded if the student speaks the text of the presentation loudly and expressively enough, dividing the sentences into syntagms, using logical emphasis correctly and avoiding monotony. 0.5 points will be deducted if the student fails to fulfill any of these requirements.

Dealing with questions	Dealing with questions takes into account the speaker's willingness to answer questions by articulating an answer or to indicate that a question is beyond the scope of the presentation.	The maximum score (1) is given if the student is able to cope with the answer to the question on the content of the presentation. 0.5 points will be deducted if: - the learner is not able to give an answer that satisfies the person who asked the question - the learner is unable to formulate an answer as such.
Portfolio	Formatting: - title page - availability of a copy of the text of the article (with obligatory indication of the source and output data) - text of the presentation speech (with highlighted structure and signposts)	The maximum score (1) is awarded for having all components of the portfolio that meet all the requirements for the design. On 0.5 points removed if: - the student does not fulfill any of these requirements - there are many careless corrections "by hand" in the text of the presentation speech
Eye-contact	Proper distribution of the speaker's attention among all listeners in the audience. Maintaining eye contact with the audience during the entire presentation.	Maximum score (1) is given if the learner distributes his/her attention among all the listeners present in the classroom. 0.5 points are removed if: - the learner does not look at the audience (working with a computer screen/projector) - tries to read the speech from a phone / sheet of paper, etc.

3. List of typical (exemplary) questions, tasks, topics for preparation for the current control on modules

Topic 1: Mathematics as a science
Classroom work: conversation on the content of the read or listened to text; checking the assimilation of lexical and grammatical material; debate on the theme "Was mathematics discovered or invented?"; formation of skills of reading the system of mathematical notations, expressions and calculation exercises in English; terminology test; role-play on the theme "Scientists of different epochs".
Independent work: reading authentic magazines and newspapers on the topic: Mathematics Magazine "MAA Mathematical Association of America", Quanta Magazine, MDPI Open Access Journals "Mathematical and Computational Applications", Mathematics Today; compiling a thematic dictionary on the material covered.

Example of a vocabulary assignment

Complete the definitions with the terms:

1. _____ number is a positive integer that is not divisible without remainder by any integer except itself and 1, with 1 often excluded. PRIME
2. _____ number is a rational number or the limit of a sequence of rational numbers, as opposed to a complex number. REAL
3. _____ number is an exact number such as 1, 7, and 24, as opposed to a number with fractions or decimals. WHOLE
4. An adjective that is used to describe that it pertains to the fourth degree is _____. QUARTIC
5. _____ is a number that can be expressed as a proportion of two whole numbers. FRACTION
6. ____ is a number that cannot be exactly expressed as a ratio of two integers. IRRATIONAL
7. In geometry, a _____ is a straight line that joins two opposite corners in a flat four-sided shape such as a square. DIAGONAL
8. An adjective that is used to show that a measurement is the volume of something, that is the height multiplied by the length and the width is _____. CUBIC
9. The decimal number system is an example of a _____ system, in which, after the base b has been adopted, the digits 1, 2, …, b − 1 are given special names, and all larger numbers are written as sequences of these digits. POSITIONAL

Topic2: Scientific discoveries and achievements in the field of mathematics and informatics
Auditorium work: conversation on the content of the read or listened text of the message; checking the assimilation of lexical and grammatical material; working in groups, discussing the main achievements of scientific and technical progress; practicing the skills of reading the system of mathematical notations, expressions and computational exercises in English; terminology test.

Independent work: working with information resources, studying the materials of practical classes, reading the main and recommended literature; compiling a thematic dictionary on the material covered.
Example of "Speaking" assignment

Individual work.

Think over the questions and get ready for the debate:

1. The Fibonacci sequence is perhaps best known from its appearance in the novel and movie "The Da Vinci Code." What are some of the real world applications of this famous sequence?

2. Name at least one mathematical idea or principle that you feel is a universal truth. Support your choice.

3. Name at least one mathematical idea or principle that you feel is a strictly man-made application or phenomena.

Topic 3: Fundamentals of combinatorics

Auditorium work: conversation on the content of the read or listened text, video material; checking the assimilation of lexical and grammatical material; practicing the skills of reading the system of mathematical notations, expressions and computational exercises in English; terminology test; solving problems on combinatorics.

Independent work: working with information resources, studying the materials of practical classes, reading the main and recommended literature; compiling a thematic dictionary on the material covered.

Example of reading assignment

Read the text and for questions 1-5, decide if the statement is TRUE or FALSE.

Combinatorics.

There are various ways in which one can try to define combinatorics. None is satisfactory on its own, but together they give some idea of what the subject is like. A first definition is that combinatorics is about counting things. For example, how many ways are there of filling an $n \times n$ square grid with 0s and 1s if you are allowed at most two 1s in each row and at most two 1s in each column? Because this problem asks us to count something, it is, in a rather simple sense, combinatorial. Combinatorics is sometimes called "discrete mathematics" because it is concerned with "discrete" as opposed to "continuous" structures. Roughly speaking, an object is discrete if it consists of points that are isolated from each other and continuous if you can move from one point to another without making sudden jumps. (A good example of a discrete structure is the integer lattice $\mathbb{Z}2$, which is the grid consisting of all points in the plane with integer coordinates, and a good example of a continuous one is the surface of a sphere.) There is a close affinity between combinatorics and theoretical computer science (which deals with the quintessentially discrete structure of sequences of 0s and 1s), and combinatorics is sometimes contrasted with analysis, though in fact there are several connections between the two. A third definition is that combinatorics is concerned with mathematical structures that have "few constraints." This idea helps to explain why number theory, despite the fact that it studies (among other things) the distinctly discrete set of all positive integers, is not considered a branch of combinatorics. In order to illustrate this last contrast, here are two somewhat similar problems, both about positive integers. i. Is there a positive integer that can be written in a thousand different ways as a sum of two squares? ii. Let a1, a2, a3, …be a sequence of positive integers, and suppose that each an lies between $n2$ and $(n+1)2$. Will there always be a positive integer that can be written in a thousand different ways as a sum of two numbers from the sequence? The first question counts as number theory, since it concerns a very specific sequence – the sequence of squares – and one would expect to use properties of this special set of numbers in order to determine the answer, which turns out to be yes.1 The second question concerns a far less structured sequence. All we know about an is its rough size – it is fairly close to $n2$ – but we know nothing about its more detailed properties, such as whether it is a prime, or a perfect cube, or a power of 2, etc. For this reason, the second problem belongs to combinatorics. The answer is not known. If the answer turns out to be yes,

then it will show that, in a sense, the number theory in the first problem was an illusion and that all that really mattered was the rough rate of growth of the sequence of squares.

1.   Combinatorics studies structures which have many constraints on them.
a. True
b. False

2.   For two points of a continuous object one can move from one point to the other without sudden jumps.
a. True
b. False

3.   The integer lattice is a continuous structure.
a. True
b. False

4.   There exists a positive integer which can be represented as a sum of two squares in a thousand of different ways.
a. True
b. False

5.   Combinatorics is a branch of number theory.
a. True
b. False

Topic 4: Combinatorics and graph theory

Auditorium work: conversation on the content of the read or listened to text, video material; checking the assimilation of lexical and grammatical material; solving problems on combinatorics; practicing the skills of reading the system of mathematical notations, expressions and computational exercises in English; terminology test; round table - report on the work done in mini groups, evaluation of results, feedback and corrections.

Independent work: working with information resources, studying the materials of practical classes, reading the main and recommended literature; compiling a thematic dictionary on the material covered.

Example of grammar assignment
Complete the second sentence so that it has a similar meaning to the first, using the words given. Use contractions whenever possible.
1. If you don't revise, you won't pass your exams.
If you revise, _____.
2. If we see your teacher, we should ask him for the correct answer.
We should ask your teacher for the correct answer when _____.
3. The world might only have one or two languages in the future if we don't protect them.
The world might only have one or two languages in the future unless_____.
4. I won't go if you don't go.
I won't go unless_____.
5. I'll be there at about 5 p.m. unless there's lots of traffic.
If there_____, I'll be there at about 5 p.m.
6. We'll go for coffee as soon as the class ends.
When_____.

`Topic 5: Scope of application of combinatorics

Auditorium work: conversation on the content of the read or listened to text, video material; checking the assimilation of lexical and grammatical material; practicing the skills of reading the

system of mathematical notations, expressions and computational exercises in English; terminology test; solving problems on combinatorics; discussion.

Independent work: working with information resources, studying materials of practical classes, reading the main and recommended literature; compiling a thematic dictionary on the material studied.

Example of a writing assignment

1.   Read the text (one of the related scientific articles) and list the main ideas.

        _____

        _____

        _____

        _____

2.   Write an introductory sentence that states the topic.

        In the article X the author Y states / claims / suggests that _____ the topic_____.

3.   Turn the main ideas from your list into sentences using your own words. Avoid repetitive language: paraphrase and use synonyms.

4.   Add linkers and transition words to connect the sentences.

5.   Write a concluding sentence that summarizes the key points.

6.   Proofread.

Topic 6: Derivative functions

Auditorium work: discussion on the content of the read or listened text, video material; checking the assimilation of lexical and grammatical material; practicing the skills of reading the system of mathematical notations, expressions and computational exercises in English; terminology test; solving problems on combinatorics.

Independent work: working with information resources, studying the materials of practical classes, reading the main and recommended literature, compiling a thematic dictionary on the material covered.

Example of a speaking task

Team work.

In small groups, prepare a short talk on one of the most important breakthroughs in mathematics and computer science. Provide valid arguments and examples to prove your assumptions.

Support your talk with images from the Internet. Timing 3-5 min talk.

Methodological materials defining the procedure for assessing knowledge, skills and possessions and (or) experience of current control activities.

The grade for the current work in the semester is given as a weighted average score based on the results of three point-rating attestations during the semester.

Assessment for each point-rating attestation is 100 points includes attendance (10%), and fulfillment of control and training tasks in classroom and independent work on the platform of virtual learning environment "Moodle". Parameters of the point-rating system used to assess the progress of students in the Department of Foreign Languages.

Current progress control is carried out during the semester in order to control the assimilation of students' knowledge, skills and proficiency in a foreign language to solve communicative problems in socio-cultural, academic and professional-business spheres of activity, timely identification of difficulties in mastering the discipline (module) and their elimination, as well as the provision of timely advisory individual assistance to students.

The control of current academic performance includes the verification of knowledge, skills and possessions:

- in class (surveys, interactive discussions, reports, presentations, role-playing games, control tasks on different types of speech activities and tests to check lexico-grammatical skills);
- according to the results of individual independent work (preparation of oral reports, performance of online practice tests and tasks for control and self-control of listening, reading, writing and lexico-grammatical skills on the platform "Moodle";
- during individual consultations with students who have academic arrears.

<u>Other forms of current control.</u>
Academic progress is assessed using the rating system. The electronic journal contains a grade for class attendance (1 point).
Control over the assimilation of the studied grammatical phenomena is carried out with the help of the educational electronic platform ""Moodle" and the results of online exercises are taken into account in the rating (if all tasks are 100% completed, then the rating table gives 10 points).

Criteria for assessing the tasks of current control on modules

Criteria for evaluation of written speech are evaluated when students roduce a written abstract.
Grades for test tasks to control lexico-grammatical skills of reading and listening are calculated as the ratio of the number of correct answers of the student to the maximum possible number of points for the test.

Current control of oral and written speech is carried out on the basis of evaluation criteria.

Criteria for assessing written abstracting
(Written Summary Assessment Criteria)
Maximum number of points - 10

Content	The presentation corresponds to the topic of the article; the style of speech is chosen correctly taking into account the purpose of the statement (academic style, objective manner of presentation); the volume of the text - 150 - 120 words.	Max 2
	The presentation corresponds to the topic of the article; some important details of the original article can be omitted (not more than 1); some violations of the style of speech (not more than 1); the volume of the text is 120 -100 words.	1,5
	The presentation mainly corresponds to the topic of the article; some important details of the original article are omitted (1-2); some violations of the style of speech (no more than 2); the volume of the text is 100 - 80 words.	1
	The presentation mainly corresponds to the topic of the article; important details of the original article can be omitted (more than 2); there are violations of the style of speech (more than 2); the volume of the text - 80 - 60 words.	0,5
	The presentation does not correspond to the topic of the article; the text length is less than 60 words.	0
Structure: cohesion, coherence	The presentation is logical and complete; there is an opening sentence that identifies the main topic or idea of the article (thesis statement); means of logical connection (linkers) are used effectively (at least 2).	Max 2

		The presentation is generally logical and complete, BUT there are 1-2 logical errors in the sequence of presentation AND/OR there are 1-2 deficiencies in the use of means of logical connection (insufficient or excessive use of means of logical connection).	1,5
		There are errors in the logic of the presentation (1-2) OR the presentation is incomplete AND/OR there are 2-3 deficiencies in the use of logical connectors (insufficient or excessive use of logical connectors).	1
		There are serious violations in the logic of the presentation (not more than 3); the presentation is incomplete AND/OR there are more than 3 deficiencies in the use of logical connection (incorrect, insufficient or excessive use of logical connection).	0,5
		There are serious violations in the logic of the presentation (more than 3); the presentation is incomplete.	0
Grammar		The grammatical structures used are appropriate to the task; there are no grammatical errors.	Max 2
		The grammatical structures used are appropriate to the task at hand; there are virtually no errors (no more than 1 minor grammatical error is allowed).	1,5
		The grammatical structures used are mostly appropriate to the task; there are a number of grammatical errors that do not hinder the understanding of the text (no more than 2).	1
		Numerous elementary level errors are made, or errors are few (no more than 4) but make it difficult to understand the text.	0,5
		Gross grammatical errors (more than 4) significantly hinder the understanding of the text.	0
Lexis		The vocabulary used corresponds to the task The vocabulary used corresponds to the task, but there may be some inaccuracies in the use of words or semantic agreement (1-2); the narration is productive, paraphrase is used.	Max 2
		The vocabulary used generally corresponds to the task set The vocabulary used generally corresponds to the task, but there are individual inaccuracies in the use of words or semantic agreement (no more than 3), or the vocabulary is limited, but the vocabulary is used correctly; more than 80% is productive.	1,5
		Limited vocabulary is used; there are irregularities in the use of vocabulary that may complicate understanding of the text (no more than 4); more than 50% of the answer is unproductive (i.e. textually coincides with the original article).	1
		Unreasonably limited vocabulary is used; there are violations in the use of vocabulary that may complicate the understanding of the text (no more than 5); more than 30% of the answer is unproductive (i.e. textually coincides with the original article).	0,5
		Limited vocabulary and numerous lexical errors (more than 5) make it impossible to accomplish the task.	0

Spelling and punctuation	There are no spelling errors. The text is divided into sentences with correct punctuation.	Max 2
	There is a number of spelling AND/OR punctuation errors (not more than 2). errors (no more than 2).	1
	There is a number of spelling AND/OR punctuation errors (no more than 4).	0,5
	There are numerous spelling and punctuation errors (more than 4).	0

Oral proficiency is assessed by solving cases, debates, role-playing, prepared monologic statements on the studied topics.

Evaluation criteria for case study analysis (Case study analysis)
Maximum number of points - 10

Assessment criteria	Grades
1. Format of the submitted decision	1
2 Reasonableness and correctness of the submitted decision	3
3. Competent and logical presentation of the solution	2
4. Ethical conduct of the discussion	2
5. Activity of work in the group	2

Debates and role-play assessment criteria (Debates and role-play assessment)
The maximum number of points is 20

Criterion/Grades	5	4	3	2
Structure and clarity of the presentation	All arguments are presented clearly, logically and consistently	In general, the arguments are presented clearly, there are some irregularities in the structure and logic of the presentation	Significant violations in the logic and sequence of the presentation, making it difficult to understand	The statement is uninstructed, the arguments are presented inconsistently

Argumentation	High level of argumentation (examples, facts, statistics, references to authoritative sources)	Good level of argumentation, with minor flaws (insufficient justification)	Average level of argumentation, insufficient persuasiveness	Weak or no argumentation (arguments are not relevant to the problem being discussed).
Counter-argumentation and defense	High level of counter-argumentation (problems and weaknesses in the opponent's position are pointed out, objections are supported by arguments)	Good level of counter-argumentation, minor problems in defending one's position are tolerated	Average level of counter-argumentation, there are serious problems with defending one's position and reflecting the opponent's arguments	Weak level of counter-argumentation, inability to point out weaknesses in the opponent's position and defend one's point of view
Speech Characteristics	The statement is correct in terms of vocabulary, grammar and pronunciation	The statement is mostly correct in terms of vocabulary, grammar, and pronunciation The manner of presentation is convincing.	There are violations in the correctness of the statement in terms of vocabulary, grammar and pronunciation The manner of presentation does not contribute to persuasiveness	Serious irregularities in the correctness of the statement in terms of vocabulary, grammar and pronunciation, impairing comprehension The manner of presentation is unconvincing
Total: maximum 20 points				

Criteria for evaluating a prepared monologic statement on the studied topics (message, description, story)
Maximum number of points - 10

Criterion	Criterion Description	Grades
Grammar	Poor knowledge of simple grammatical forms / Does not try to use more complex constructions	0
	Limited knowledge of simple grammatical forms / Does not attempt to use more complex constructions	1
	Uses simple grammatical forms well / little attempt to use more complex structures	2

	Good use of simple grammatical forms / tries to use more complex constructions	3
Lexis	Uses single words and phrases	0
	Uses limited vocabulary to discuss familiar situations	1
	Mostly uses appropriate vocabulary to discuss familiar topics	2
	Uses appropriate vocabulary to discuss a range of familiar topics	3
Fluency	Significant number of pauses of hashing / frequent repetition of information	0
	Gives answers that go beyond a short phrase, with some pauses / sentences are mostly on topic / some repetition is present / uses only basic techniques of logical connection	1
	Pronounces long stretches of speech with uncertainty / mostly uses a range of linking words correctly / some repetition is present	2
	Pronounces long stretches of speech, allowing for pauses of hesitation/ uses linking words correctly/ uses little repetition	3
Pronunciation	Limited phonological skills; utterance can mostly be understood	0,5
	Shows good phonetic-phonological skills at the word/sentence level	1