

**Federal State Autonomous Educational Institution of Higher Education "Moscow
Institute of Physics and Technology
(National Research University)"**

APPROVED
Vice Rector for Academic Affairs

A.A. Voronov

Work program of the course (training module)

course: History of Russia: History and Philosophy of Science and Technology/История России:
История и философия науки и технологий

major: Applied Mathematics and Informatics

specialization: Computer Science/Информатика
Phystech School of Applied Mathematics and Informatics
Educational and scientific center for the humanities and social sciences

term: 4

qualification: Bachelor

Semesters, forms of interim assessment:

7 (fall) - Grading test

8 (spring) - Grading test

Academic hours: 60 AH in total, including:

lectures: 60 AH.

seminars: 0 AH.

laboratory practical: 0 AH.

Independent work: 120 AH.

In total: 180 AH, credits in total: 4

Number of course papers, tasks: 6

Author of the program: A.S. Klemeshov, candidate of historical sciences, associate professor

The program was discussed at the Educational and scientific center for the humanities and social sciences 30.08.2024

Annotation

The course deals with the main problems of history and philosophy of science and technology in Russia and the world, the issues of chronology and periodisation of the history of science and technology; attention is paid to the key discoveries and achievements in the field of scientific and technological development from ancient times to the beginning of the 21st century, in close interrelation with social processes, institutional structure and culture of a historically specific society. The course is built on the problem-chronological principle, including the study of both the main stages of human development from ancient times to the beginning of the 21st century, and the most important events and processes in the field of scientific and technological development within the history of mankind from ancient times to the present day. Attention is paid to the consideration of interrelated problems and processes of world and national history and their critical analysis.

In the course, the most important events and processes of the history of world and Russian science and technology are considered in the light of the assessments developed in classical and modern historiography, and the author's view on key problems of the history of science and technology is also given. The course integrates content components designed to facilitate the formation of a systematic and timely response to the current challenges of social and educational policy of the Russian state through the creation of conditions for self-determination and socialisation of students on the basis of generally accepted values and behavioural norms, the formation of a developed sense of citizenship and patriotism. These content components are based on the module "Fundamentals of Russian Statehood", which is recommended for mandatory inclusion in the educational programmes of higher education institutions in accordance with the letter of the Ministry of Education and Science of 21.04.2023 No MN-11/1516-PK.

The course, designed for MIPT undergraduate students, involves discussion of the key problems of the course.

1. Study objective

Purpose of the course

Formation of students' comprehensive understanding of the development of technology and scientific knowledge, the relationship between scientific and technological achievements and political, socio-economic processes, phenomena in the field of religion, education and culture, obtaining systematised knowledge of the basic regularities and features of the world-historical process and global and domestic scientific and technological development; formation of students' civic identity of the Russian society, formation of a comprehensive understanding of the historical and socio-economic processes, the development of a systematic approach to the development of scientific and technological knowledge; formation of students' understanding of the historical and socio-economic processes, the interrelationship between scientific and technological achievements and political, socio-economic processes, phenomena in the field of religion, education and culture

Tasks of the course

- Formation of a holistic understanding of the main stages of scientific and technological development of mankind, the features of these stages;
- developing skills of building cause-and-effect relations between changes in the life of historical societies and their technological achievements;
- developing an understanding of the place and role of the graduate's field of activity in social development and its interrelation with other social institutions;
- developing skills of obtaining, analysing and generalising historical information, and the ability to think logically;
- developing an understanding of citizenship and patriotism, the desire to serve its interests, including the defence of Russia's national interests;
- revealing the value and behavioural content of the sense of citizenship and patriotism as devotion to one's Fatherland, inseparable from well-developed critical thinking, free personal development and the ability to make independent judgments about the current political and cultural context.

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
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UC-5 Reflect on the cultural diversity of society from social-historical, ethical, and philosophical perspectives	UC-5.1 Demonstrate the knowledge of the basics of philosophy, history, the foundations of intercultural communication
	UC-5.2 Understand ethical and intellectual norms and values, their role in the history of society

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

As a result of studying the course the student should:

know:

- the main stages of scientific and technological development of mankind, and the specifics of these stages;
- concepts and terms related to the history of science and technology;
- the main problems and historiographical concepts of the history of science and technology;
- peculiarities of modern Russian statehood and actual political structure of the country in a broad cultural-value and historical context, to perceive the continuous nature of national history and the multinational, civilisational vector of its development;
- peculiarities of modern political organisation of Russian society, causal nature and specificity of its actual transformation, value support of traditional institutional solutions and special polyvariance of relations between the Russian state and society in the federal dimension.

be able to:

- analyse problems of the history of scientific and technological development of Russia and the world, establish cause-and-effect relationships between events and processes;
- compose abstracts on a given topic;
- correctly evaluate and select the necessary information, analyse, systematise and summarise it;
- plan and carry out their activities taking into account the results of this analysis.

master:

- understanding of key events in Russian and world history related to major scientific and technological changes;
- skills of analysing historical sources;
- skills of written argumentative presentation of one's own point of view;
- skills of critical perception of information;
- basic terminology and conceptual apparatus in the history of science and technology in Russia and the world.

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	Development of science and technology in historical perspective: main approaches to the study.	8			16
2	Technologies of primitive society and the Ancient World.	10			20
3	Science and technology in Russia and Western Europe on the threshold of the New Age.	12			24
4	Science and Technology in the Nineteenth Century.	14			28

5	Main problems of scientific and technological development in the twentieth and early twenty-first centuries and their global context	16			32
AH in total		60			120
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: 7 (Fall)

1. Development of science and technology in historical perspective: main approaches to the study.

History in the system of social and humanitarian sciences. Fundamentals of the methodology of historical science. History of study and current approaches to the study of scientific and technological development. The concept of technical, engineering, technology. The concept of science. The notion of "normal science" and "scientific revolution", "scientific community". Scientist and engineer as a social role, status, profession. Interrelation and mutual influence of scientific and technological development and social, political and economic processes.

2. Technologies of primitive society and the Ancient World.

The agricultural revolution as the first technological revolution in history. The role of grain farming. Natural and geographical factors in the development of the first civilisations and discussions on the concept of agricultural revolution by J. Diamond and J. Scott.

Scientific and technological knowledge in the ancient world, Aristotle as the "first scientist"? Discussions on the role of the church and theology in the development of scientific knowledge in Western Europe, the influence of Aristotle's cosmogony and physics in the Middle Ages. The problem of Europocentrism in the study of the history of science and technology. Reception of the heritage of antiquity in the Arab world and the influence of Arab science in medieval Europe. Knowledge and Technology in Ancient China. "Needham's Paradox.

3. Science and technology in Russia and Western Europe on the threshold of the New Age.

The birth of science in the modern understanding, its theoretical and institutional foundations. Court society and patronage as factors in the development of science. Galileo Galilei at the Medici court. The separation of the scientific and "non-scientific": the role and place of alchemy in the development of early scientific knowledge. The emergence and institutionalisation of experimentation as a way of producing, proving and presenting scientific knowledge. Experiments of R. Boyle. The problem of applied applicability of early scientific knowledge. Scientific knowledge in Russia from Peter I to Catherine II, the birth of the Academy of Sciences.

"Revolution in military science": from invention of gunpowder to mass use of firearms. The problem of low effectiveness of early firearms. Organisational innovations in military affairs. Why did the "revolution in military science" take place in Western Europe and not in China? The impact of the transition to the mass use of firearms on the formation of modern bureaucracy: the concept of the "military-fiscal state" and the transformations of Peter the Great in Russia.

У истоков промышленной революции: паровой двигатель. Первые попытки использования парового двигателя в Западной Европе и России. Проблема разрыва между научным знанием и технологиями на раннем этапе промышленной революции. Эпоха Просвещения и «промышленное Просвещение». Экономический и институциональный контекст внедрения парового двигателя в Англии. Предпосылки для возникновения промышленной революции.

4. Science and Technology in the Nineteenth Century.

From artisanal to factory production. Movement towards standardisation and interchangeability of parts in mass production. The development of the arms industry in Russia in the XIX century.

The invention of the research university. The decline of the classical university in the eighteenth century. Napoleonic university. Humboldt and the new model of the university in the context of the Prussian political project. From the Humboldt University to the emergence of the new model of the research university in the USA. Universities and University Science in Imperial Russia. D.I. Mendeleev and his table in the context of the formation of modern science.

Steam locomotive, steamship, telegraph: new technologies of transport and communication and their socio-economic and cultural impact. Technological development and European colonialism in the 19th century.

Development of historical science in Europe and Russia. Formation of civilisation approach to the historical process. Domestic theorists of the civilisation approach: N.Y. Danilevsky. Understanding of Russian history as a part of world history. Study of Russian history in interrelation with the history of other countries and peoples, in connection with the main events and processes that had a great impact on the course of world history. The phenomenon of Russian civilisationism. Pros and cons of the civilisation approach. Competing scientific paradigms - the formation approach, nationalism, social constructionism.

5. Main problems of scientific and technological development in the twentieth and early twenty-first centuries and their global context

Formation of the Soviet model of science organisation. Scientific and technological industry in the ideological, social and political context of the early USSR. The role of technological borrowings in the megaprojects of the first five-year period.

The Soviet military-industrial complex and technological development. The Soviet atomic project. Competition as a principle of organisation of the Soviet military-industrial complex. The phenomenon of "science cities", Novosibirsk Akademgorodok. Institutional organisation of Soviet science, the role of research in universities.

Influence of Marxist ideology on the development of natural sciences in the USSR. Cybernetics and quantum physics as "bourgeois sciences" and their rehabilitation. Organisation of party control over science in the post-war USSR.

Science and technology in late Soviet society and culture. Sociology and demography of the research and development industry in the late USSR. Formation of the subculture of the Soviet scientific and technical intelligentsia, "physics" and "lyrics". The problem of quasi-scientific and pseudoscientific knowledge in the late USSR and the post-Soviet period.

Scientific and technological development in the late USSR and the world: parallels and differences. The Internet and the "Soviet Internet". Ecological movement in the world and in the USSR.

Multinational (supranational) character of Russian society. The phenomenon of the Soviet people. Transition from imperial to federative organisation of the state and society. Projects, events and practices uniting the society. Intercivilizational dialogue inside and outside Russia. Global world and ciphilisational development. Digital "open society" and preservation of the specifics of Russian civilisation. The impact of urbanisation on civilisational development. "Special Becoming" and the mission of Russia in the ideological heritage of Russian and foreign philosophers, historians, politicians, cultural figures, artists and scientists.

Russia and the World in the Context of Problems and Prospects of Scientific and Technological Development in the XXI Century. Fundamentals of the constitutional system of modern Russia and its origins. Basic principles of state structure: the principle of separation of powers, democratic foundations. State and political organisation of Russian society. Matrix character of Russian politics. Key elements of the Russian state organisation. The Constitution of Russia, its history and modernity. Genealogy of the leading political institutions, their history, causes and consequences of transformation. History of Russian representation. Existing state and national projects of long-term development of the country, their significance (key sectors, human resources, social sphere).

Global trends and peculiarities of the world development at the present stage. Demographic, economic, technogenic, environmental problems, their relevance for the Russian Federation. The problem of the image of the future. Sovereignty of the country and its place in the scenarios of prospective development of the world and Russian civilisation. Value guidelines for the development and prosperity of Russia. Solidarity, unity and stability of the Russian society in the civilisational dimension. Striving for compromise, altruism and mutual assistance as significant principles of Russian policy, both internal and external. Responsibility and mission as guidelines for personal and social development. Justice and meritocracy in Russian society: traditions and modernity. Problems of forming the idea of the communitarian nature of Russian citizenship, the inseparability of personal success and the well-being of the Motherland. Stability as a key result of the previous decades of consolidation of the Russian political system

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

The implementation of the discipline requires the availability of a classroom of appropriate capacity. The lectures are delivered using a marker or slate board, chalk/markers, tables, diagrams. Technical means of education: computer with licensed software, multimedia projector.

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

Main literature

Рекомендуемая литература для самостоятельного изучения

Ушаков, Е. В. Философия техники и технологии : учебник для вузов / Е. В. Ушаков. — Москва : Издательство Юрайт, 2024. — 307 с. — (Высшее образование). — ISBN 978-5-534-04704-2. — Текст : электронный // Образовательная платформа Юрайт [сайт]. — URL: <https://urait.ru/bcode/539163> (дата обращения: 17.12.2024).

Шуталева, А. В. Философские проблемы естествознания : учебное пособие для вузов / А. В. Шуталева. — Москва : Издательство Юрайт, 2024. — 163 с. — (Высшее образование). — ISBN 978-5-534-06758-3. — Текст : электронный // Образовательная платформа Юрайт [сайт]. — URL: <https://urait.ru/bcode/540422> (дата обращения: 17.12.2024).

Рачков, М. Ю. История науки и техники : учебник для вузов / М. Ю. Рачков. — 3-е изд., испр. и доп. — Москва : Издательство Юрайт, 2024. — 297 с. — (Высшее образование). — ISBN 978-5-534-15022-3. — Текст : электронный // Образовательная платформа Юрайт [сайт]. — URL: <https://urait.ru/bcode/543060> (дата обращения: 17.12.2024).

Additional literature

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

www.hronos.ru

www.istorik.ru

www.gumer.info

Географическая история России Дата: 24.02.13 Имя файла: geograficheskuyu-istoriyu-rossii.zip
<http://www.rggukf.ru/blogs/mefif/skachat-geograficheskuyu-istoriyu-rosi.html>

Отечественная история России новейшего времени. 1985-2005 гг. Отв. ред. Безбородов А.Б. — М.: РГГУ, 2007. — 804 с.. <http://www.alleng.ru/d/hist/hist195.htm>

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

Microsoft Windows
Microsoft Office
Kaspersky Endpoint Security
Zoom
LMS Moodle

9. Guidelines for students to master the course

For successful mastering of the course, in addition to attending lectures, students are required to work independently for at least the hours specified in the curricula of the faculties. Independent studies also include repetition of lecture material, preparation for writing control papers and essays.

The composition of assignments for current independent work includes, first of all, work with the material given during lectures and consultations. Since some of the topics are assigned for independent study, the independent work also includes search and review of literature and electronic sources of information on these topics. In addition, students prepare for independent work and write essays on the proposed or self-selected topics. Finally, an integral part of students' independent work on the course is preparation for the differentiated credit, which completes the study of the course.

Creative problem-oriented independent work of students in the course of mastering the discipline, aimed at the development of intellectual skills, a set of universal (general cultural) and professional competencies, increasing the creative potential of students, includes the search, analysis and structuring of information on the topics studied in the course of ongoing training and preparation for writing test papers. In addition, the course programme provides for the writing of essays on the proposed or independently selected problems.

Assessment funds for course (training module)

major: Applied Mathematics and Informatics
specialization: Computer Science/Информатика
Phystech School of Applied Mathematics and Informatics
Educational and scientific center for the humanities and social sciences
term: 4
qualification: Bachelor

Semesters, forms of interim assessment:

7 (fall) - Grading test
8 (spring) - Grading test

Author: A.S. Klemeshov, candidate of historical sciences, associate professor

1. Competencies formed during the process of studying the course

Code and the name of the competence	Competency indicators
UC-5 Reflect on the cultural diversity of society from social-historical, ethical, and philosophical perspectives	UC-5.1 Demonstrate the knowledge of the basics of philosophy, history, the foundations of intercultural communication
	UC-5.2 Understand ethical and intellectual norms and values, their role in the history of society

2. Competency assessment indicators

As a result of studying the course the student should:

know:

- the main stages of scientific and technological development of mankind, and the specifics of these stages;
- concepts and terms related to the history of science and technology;
- the main problems and historiographical concepts of the history of science and technology;
- peculiarities of modern Russian statehood and actual political structure of the country in a broad cultural-value and historical context, to perceive the continuous nature of national history and the multinational, civilisational vector of its development;
- peculiarities of modern political organisation of Russian society, causal nature and specificity of its actual transformation, value support of traditional institutional solutions and special polyvariance of relations between the Russian state and society in the federal dimension.

be able to:

- analyse problems of the history of scientific and technological development of Russia and the world, establish cause-and-effect relationships between events and processes;
- compose abstracts on a given topic;
- correctly evaluate and select the necessary information, analyse, systematise and summarise it;
- plan and carry out their activities taking into account the results of this analysis.

master:

- understanding of key events in Russian and world history related to major scientific and technological changes;
- skills of analysing historical sources;
- skills of written argumentative presentation of one's own point of view;
- skills of critical perception of information;
- basic terminology and conceptual apparatus in the history of science and technology in Russia and the world.

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

Students write essays at the teacher's choice either on one of the topics chosen by students, an approximate list of which is given below (other topics are also possible), or in the form of an independent research on the topic "Scientific and technical achievements of my small homeland". The student is offered to search and process information about any scientific and technical achievement or object in his/her small homeland - an infrastructural high-tech object (a bridge, a dam, a hydroelectric power plant, an observatory, etc.), a discovery made by a famous fellow countryman (a scientist, an engineer, etc.), reflected in local history literature, a museum exposition, etc. In this case, the abstract is proposed to follow a certain plan: a brief description of the object/achievement/discovery, information about its authors/creators/developers, its significance for the scientific and technical development of Russia and/or the world, the current state of the object/use of technology, etc., its memory (monuments, memorials, reflection in the museum exposition).

Topics of essays and independent works

1. The concept of "scientific revolution" and its criticism.

2. The role of grain farming in the development of the first civilisations.
3. Aristotle as "the first scientist".
4. The role of the Church and theology in the development of scientific knowledge in medieval Europe.
5. Knowledge and technology in ancient China.
6. Scientific knowledge in pre-Mongol Rus.
7. Formation of science in early modern times.
8. Thinkers and scientists of the High and Late Renaissance (to choose from: Galileo, Copernicus, Francis Bacon, Miguel Servetus, etc.).
9. Experimentation as a way of knowledge in early modern science.
10. Scientific Knowledge in Russia in the First Half of the XVIII Century.
11. Mikhail Lomonosov - "the first Russian university".
12. Birth of the Russian Academy of Sciences.
13. Russian science in the second half of the XVIII - early XIX centuries.
14. Russian education in the second half of the XVIII - early XIX centuries.
15. History of the invention of the steam engine.
16. Industrial revolution in Europe and Russia: comparative characteristics.
17. The Age of Enlightenment and the Industrial Revolution.
18. Russian invention and Russian science in the XIX century.
19. Oil and gas in the history of Russia.
20. Development of transport in Russia and the world in the second half of the XIX century.
21. Alexander Humboldt and his contribution to science.
22. Napoleonic University.
23. Universities and university science in Imperial Russia.
24. D.I. Mendeleev and the significance of his achievements for the formation of modern science.
25. Discoveries and inventions in the sphere of transport in the XIX century and their significance.
26. Infrastructure of the XIX century: achievements and discoveries.
27. The Soviet model of the organisation of science.
28. Science in the USSR of the era of the first five years.
29. Soviet science during the Great Patriotic War.
30. Cultural Revolution in the USSR.
31. Soviet atomic project.
32. The phenomenon of science cities.
33. Novosibirsk Akademgorodok.
34. Cybernetics and quantum physics as "bourgeois sciences" and their rehabilitation.
35. Party Control over Science in the Postwar USSR.
36. The first artificial satellite of the Earth.
37. USSR in the space race.
38. "Silicon Valley" in the USA as a scientific and technological centre.
39. Scientific and technological revolution: causes and consequences.
40. The Internet and the "Soviet Internet".
41. Ecological movement in the world and in the USSR.
42. Problems and prospects of modern Russian science.
43. State symbols of Russia: history and modernity.
44. Civilisational approach in the study of the history of states.
45. Sovereignty of the country and its place in the scenarios of prospective development of the world and Russian civilisation.

4. Evaluation criteria

Questions for preparation for credit:

Semester 7

1. historical sciences in the system of social and humanitarian sciences. Chronology and periodisation. Fundamentals of the methodology of historical sciences.

2. The concept of "scientific revolution" and its interpretations.
3. Neolithic agricultural revolution.
4. The first civilisations and natural-geographical factors of their development.
5. Scientific and technological knowledge of the ancient world.
6. Aristotle and his contribution to the development of scientific knowledge.
7. Scientific knowledge in medieval Europe.
8. The Church and scientific and technological development in medieval Europe.
9. Scientific and technological knowledge in Ancient Russia.
10. Arab science and the heritage of antiquity in the Arab world.
11. Knowledge and technology of Ancient China.
12. Great geographical discoveries and scientific and technological achievements of the XV-XVI centuries.
13. Birth of Science in Early Modern Times.
14. Experimentation as a way of cognition and presentation of scientific knowledge in the Early Modern period.
15. Science in Russia in the era of Peter the Great's reforms.
16. Birth of the Russian Academy of Sciences.
17. Firearms and the "revolution in military science".
18. Reforms of Peter the Great and the concept of military-fiscal absolutism.
19. Europe on the Threshold of the Industrial Revolution: Political and Economic Development.
20. Steam engine and problems of its introduction in Europe and Russia.
21. The Age of Enlightenment and the "Industrial Enlightenment".
22. Mikhail Lomonosov - "the first Russian university".
23. Transition to factory production: social, economic, technological consequences.
24. Industrial revolution in Europe and Russia: comparative characteristics.
25. The development of industry in Russia in the XIX century.
26. From classical to research university. Napoleonic University. Alexander Humboldt and his contribution to university education.
27. Universities and education in Russia in the eighteenth and nineteenth centuries.

8 semester:

1. Development of science and technology in Russia in the nineteenth century.
2. Development of transport infrastructure in Russia and the world in the 19th century.
3. New technologies of communication and information transfer and their impact on the development of the state and society.
4. D.I. Mendeleev and the significance of his achievements for the formation of modern science.
5. The Soviet model of organisation of science.
6. Soviet science during the Great Patriotic War.
7. The Cultural Revolution in the USSR and its contribution to the technological development of the country.
8. The Soviet atomic project.
9. The phenomenon of science cities.
10. Novosibirsk Akademgorodok. Its role in the scientific and technological development of the USSR.
11. Cybernetics and quantum physics as "bourgeois sciences" and their rehabilitation.
12. Power and science in the post-war USSR.
13. The beginning of the Soviet space programme. The first artificial satellite of the Earth.
14. The USSR in the space race.
15. "Silicon Valley" in the USA as a scientific and technological centre.
16. Scientific and technological revolution of the twentieth century: causes and consequences.
17. Information revolution. The Internet and the "Soviet Internet".
18. Ecological movement in the world and in the USSR.
19. Technopolises. Urbanisation and scientific and technological development.
20. Digital technologies and their socio-economic impact.
21. Russian science and education in market conditions.

22. Problems and prospects of modern Russian science.
23. State symbols of Russia: history and modernity.
24. Civilisational approach in the study of the history of states.
25. Sovereignty of the country and its place in the scenarios of prospective development of the world and Russian civilisation.
26. Digital "open society" and preservation of the specificity of Russian civilisation.

Example of a ticket for differentiated credit:

1. Problems and prospects of modern Russian science.
2. State symbols of Russia: history and modernity.

Score of "excellent (10)" - deserves a student who has found a comprehensive, systematic and in-depth knowledge of the study programme material, who has independently completed all the tasks provided by the programme, who has thoroughly mastered the main and additional literature recommended by the programme, who has worked actively in class, who understands the main scientific concepts of the discipline, who has shown creativity and a scientific approach in understanding and presenting the study programme material, whose answer is distinguished by the richness and accuracy of the terms used,

Score of "excellent (9)" - deserves a student who has found a comprehensive, systematic knowledge of the educational programme material, who has independently completed all the tasks provided by the programme, who has thoroughly mastered the basic literature and is familiar with additional literature recommended by the programme, who has worked actively in class, who has shown a systematic nature of knowledge in the discipline, sufficient for further study, as well as the ability to replenish them independently, whose answer is distinguished by the accuracy of the terms used, and the presentation of the material in it after the completion of the programme.

The grade "excellent (8)" - deserves a student who has found full knowledge of the curriculum material, does not allow significant inaccuracies in the answer, independently completed all the tasks provided by the programme, mastered the basic literature recommended by the programme, actively working in class, showing a systematic nature of knowledge in the discipline, sufficient for further study, as well as the ability to replenish them independently.

Grade "good (7)" - deserves a student who has found a sufficiently complete knowledge of the curriculum material, does not allow significant inaccuracies in the answer, independently completed all tasks provided by the programme, mastered the basic literature recommended by the programme, actively working in the classroom, showing the systematic nature of knowledge in the discipline, sufficient for further study, as well as the ability to replenish them independently;

The grade "good (6)" - deserves a student who has found a sufficiently complete knowledge of the curriculum material, does not allow significant inaccuracies in the answer, independently completed the main tasks provided by the programme, mastered the basic literature recommended by the programme, was sufficiently active in the classroom, showed a systematic nature of knowledge in the discipline, sufficient for further study;

Assessment "good (5)" - is deserved by the student who has found out the knowledge of the basic educational-programme material in the volume necessary for further study and the forthcoming work on a profession, not distinguished by activity in classes, independently carried out the basic tasks provided by the programme, mastered the basic literature, recommended by the programme, however having made some errors at their performance and in the answer on a test, but possessing necessary knowledge for independent elimination of the admitted errors;

The grade "satisfactory (4)" - is deserved by the student who has found out the knowledge of the basic educational-programme material in the volume necessary for further study and the forthcoming work on a profession, who was not distinguished by activity at classes, who has independently carried out the basic tasks provided by the programme, who has mastered the basic literature recommended by the programme, but who has made some errors at their performance and in the answer at the test, but possesses necessary knowledge for elimination under the guidance of the teacher of the admitted errors;

Satisfactory (3) - is deserved by the student who has found out the knowledge of the basic educational-programme material in the volume necessary for the further study and the forthcoming work on a profession, who was not distinguished by activity at classes, who independently carried out the basic tasks provided by the programme, but made mistakes at their performance and in the answer on the test, but possessing the necessary knowledge for elimination under the guidance of the teacher of the most essential mistakes;

The grade "unsatisfactory (2)" - is given to the student who has found gaps in knowledge or lack of knowledge of a significant part of the basic educational programme material, who has not independently completed the basic tasks provided by the programme, who has made fundamental errors in the performance of tasks provided by the programme, who makes significant errors in answering, and who is unable to continue his/her studies or start professional activity without additional training in the relevant discipline;

Assessment "unsatisfactory (1)" - no answer (refusal to answer) or the submitted answer does not fully correspond to the essence of the questions contained in the assignment.

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

The differentiated credit is conducted in the form of an oral questionnaire. The student is given limited time to prepare for the answer, as a rule, no more than 0.5 hours. During the differential credit students can use the programme of the discipline.