TAJIK NATIONAL UNIVERSITY
DEPORTMENT OF THE THEORETICAL PHYSICS

WORK PROGRAM (SILLABUS)
ON THE SUBJECT OF THE CONCEPT OF MODERN NATURAL SCIENCES

Subject: Concepts of Modern Natural Science

Specialty: _

Number of study hours – 1.5 credit (36 hours)

Lecture - 16 hours (0.7 credit)

Practical classes - 8 hours (0.3 credit)

independent work of students - 12 hours (0.5 credit)

Course – 2

Dushanbe – 2025

Sillabus (extended work program) is compiled on the basis of the state standard of higher vocational education of the Republic of Tajikistan approved by the Ministry of Education of the Republic of Tajikistan on 11.06.2005 for students of the Faculty of Russian Language and Literature.

Sillabus (extended work program) was compiled by the head of the department of theoretical physics, associate professor Odilov O.Sh.

The syllabus (extended work program) was approved at the meeting of the chair protocol №.7 25 01 2025.

The head of the department Odilov O.Sh.

Recommended for publication by the Methodological Council of the Faculty of Physics, protocol №.5, 24. 01. 2025.

Chairman of the Council: _____ Istamov F.

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I. Time table of classes

FULL NAME. teacher	Auditory lessons		independent work	Teacher's address
	lecture	practice		
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II. Explaining the position of the subject in the learning process

The concept of higher education presupposes the training of specialists who, along with deep knowledge in the chosen industry, have a broad outlook in all fields of science and human activity. Therefore, the discipline of the "Concept of Modern Natural Science" is an important link in the education of students. This subject allows students to form a holistic view of the world around them, have a clear idea of the physical picture of the world, as the basis for the integrity and diversity of nature, as well as the study and understanding of the essence of a limited number of fundamental laws of nature.

III. Objectives of studying the discipline

The main goal of the discipline, encompassing all aspects of modern natural science, is the formation of a natural-science worldview, the expansion of the horizon and the upbringing of a natural-science culture. Special attention is given to understanding the general principles of scientific thinking, the methods of modern natural science, the history of natural science, the close interrelationship of various areas of natural sciences, the role of natural science in the development of culture and society. An important goal of the discipline is the presentation of natural science in the continuous development and overcoming of uncertainties and contradictions, the creation of students' interest in the continuous deepening of their knowledge and in broadening their horizons.

IV. The tasks of studying the discipline

As a result of studying the discipline, the student should get an idea of the basic natural scientific terminology, the main stages of the development of natural science, the generality and features of the action of the basic laws governing the universe in all forms of its manifestation. The study of discipline is based on the knowledge acquired by students in the school, which are consolidated, deepened and expanded with the formation of students' active thinking style and a steady focus on constant self-learning and self-education. The received knowledge and skills are realized and are developed in the course of further training and subsequent labor activity. Mastering discipline will create a reliable basis for further self-education, expansion of the circle of interests and better understanding of the set of natural scientific information that everyone has to face.

V. Final results of the study of the discipline

As a result of studying the discipline:

• students should form clear ideas about the physical picture of the world;
• they must understand the essence of the fundamental laws of nature, and be

familiar with the principles of modeling natural phenomena;
• they should understand the need to change the language of description of natural processes as they become more complex from macroscopic systems to quantum systems, from inanimate systems to living cells, the organism, the biosphere;
• they must form ideas about the principles of universal evolutionism and synergetics;
• they must understand the problems of ecology and society in their connection with the basic concepts and laws of natural science.

VI. The subjects of the classes on the subject

Weeks	№ п/п	Names of the topic of classroom activities		independent work	Number of hours	date of completion
		lecture	practical			
1	2	3	4	5	6	7
I.	1.	science as part of culture			1	
	2.		science as part of culture		2	
II.	3.	Structure and methods of scientific knowledge			1	
	4.		Structure fnd methods of scientific knowledge		2	
III.	5.	History of natural science			1	
	6.		History of natural science		2	
IV.	7.	History of natural science in the Renaissance			1	
	8.		History of natural science in the Renaissance		2	
V.	9.	Development of natural science in the 18-19th centuries			1	
	10.		Development of natural science in the 18-19th centuries		2	
VI.	11.	The second scientific revolution			1	
	12.		The second scientific revolution		2	
VII.	13.	General ideas about the Universe			1	
	14.		General ideas about the Universe		2	
VIII.	15.	Synergetic as a concept of self-organization			1	
	16.		Synergetic as a concept of self-organization		2	

VII. Literature

1. T.G. Grushevitskaya, A.P. Sadokhin Concepts of modern natural science. – M.: UNITA-DIANA, 2003, – 670 p.
2. M.K. Guseikhanov, O.R. Radjabov Concepts of modern natural science. – M.: Publishing and trading corporation "Dashkov and K°", 2007, – 540 p.
3. V.N. Lavrinenko, V.P. Ratnikova Concepts of modern natural science. – M.: UNITA-DIANA, 2006, – 317 p.
4. L.A. Mikhailov Concepts of modern natural science. – Peter, 2008, 336 p.
5. Starodubtsev V.A. Concepts of modern natural science. – Tomsk, 2002, 184 p.
6. Naidysh V.M. Concepts of modern natural science. – M., 1999, 431 p.
7. Dubnisheva T.Ya. Concepts of modern natural science. – M., 2006, 608 p.
8. V.A. Ignatova Concepts of modern natural science. – Tyumen, 2005, 213 p.
9. Ruzavin G.I. Concepts of modern natural science. – M., 2006, 303 p.
10. S.I. Samygin Concepts of modern natural science. – Rostov n/ D, 2003, 448 p.

VIII. Teacher Requirements

The criteria for assessing knowledge include the consistency of the presentation of the answer, the ability to analyze, active participation in the class.

The result of the assessment will also be influenced by non-fulfillment of the assignment, missed classes without valid excuses, improper conduct during class.

When attending classes, the following rules should be observed:

1. Do not be late for classes.

2. Do not miss classes without good reason.

3. The missed classes should be worked out at the time indicated by the teacher.

4. Actively participate in classes, conscientiously perform all tasks.

5. According to the schedule of the educational process in time to take all types of control tasks.

6. Do not leave the classroom without the permission of the teacher.

7. Turn off cellular phones and players.

8. Behave yourself, observe the ethics of behavior in a public place.

IX. Requirements for the level of discipline

A student studying this academic discipline must:

- know the basic concepts and paradigms of modern natural science;

- be able to creatively use ideas about the basic principles, patterns and approaches inherent in modern natural science, in situations related to the need to address worldview significant problems;

- *master the skill of using the main types of scientific methods, taking into account their specificity and complementarity to the artistic method of mastering reality, to understand the unity of the principles of describing the natural-science and humanitarian spheres of a single culture.*

Discipline is studied for one semester and is designed for 40 hours of lectures (2 credits), 16 hours of lectures and 24 hours of seminars. As a current knowledge control the student must fulfill 2 rating tasks.

The form of final control is the exam.

Table 1

The procedure for assigning probable (possible) grades to a student

Letter expression of the assessment	**Numerical expression of the evaluation score**	**Percentage (%) of correct answers**	**Traditional system assessment**
A	4,0	95 - 100	Great
A-	3,67	90 - 94	
B+	3,33	85 - 89	Fine
B	3,0	80 - 84	
B-	2,67	75 - 79	
C+	2,33	70 - 74	satisfactorily
C	2,0	65 - 69	
C-	1,67	60 - 64	
Д	1,33	55 - 59	
Д-	1,0	50 - 54	
U	0	0 - 49	unsatisfactory