

Subject Platform		
Full name of the discipline: Physics 1.2		
Subject code: FIZ11208	Academic credits (ECTS): 8	Duration: 1,2 semesters
Department: Physics and Energy		
For students of which fields of study is the subject: 60710100 - Chemical Engineering 60721100 - Oil and Oil and Gas Processing Technology 60720900 - Technology of the Petrochemical Industry 60721000 - Deep Gas Processing Technology 60720700 - Materials Science and Technology of New Materials (by industry)		
Lecturers: Asatov Urolbay Toshniyazovich, Ernazarov Samsiddin Norchayevich, Tulametov Makhmudjon Akhmedovich, Muminova Zaynab Arabovna, Usarov Ravshan Rustamovich.		
Total hours allocated to the subject: 240 hours	Email: uralboyasatov@gmail.com shamsiddinernazarov123@gmail.com , maxmudtulametov@gmail.com ,	
Teacher (s): Karimova Sanobar Toybayevna, Qayumova Munajat Rakhmatullayevna, Abdurazzoqova Gulhayo Otabek kizi, Buriboyev Shavkat.		
Prerequisites: Compulsory subject. Students' theoretical knowledge of the subject and must have concepts about laboratory work.		
Brief description of the subject: Physics reveals general laws about physical phenomena in nature, and these laws, in turn, are practically used in other sciences and in the field of technology. In physics, mechanical motion, vibrations and waves, the fundamentals of molecular kinetic theory, the fundamentals of thermodynamics, electrostatics, and the laws of direct current are studied. In physics, electromagnetic phenomena, the basic laws of light, quantum optics, thermal radiation, the phenomenon of the photoelectric effect, and the structure of the atom and nucleus are studied.		

Objective of the discipline: The main purpose of studying physics is to familiarize future technologists with the fundamental laws of science and to understand the course of these physical processes when working in their specialty in the future.

At the end of the course, students will acquire the following skills and abilities:

The purpose of the discipline is described on the basis of this syllabus. The main task of the discipline is, on the one hand, to explain the essence of physical phenomena in nature, everyday life, production, and technology through fundamental concepts, and on the other hand, to form students' theoretical knowledge on the path to creating their physical models when solving

problems arising in their future specialties, including the calculation of motion, vibrations, the balance of matter and heat in technological cycles, the movement of liquids and gases under various conditions, and the calculation of the kinetics of chemical reactions.

Goals allow students to learn:

- a scientific worldview about reality is formed;
- concepts of mechanical, electromagnetic, and nuclear forces are formed;
- can explain thermal processes based on molecular-kinetic theory;
- masters methods for calculating simple electrical circuits;
- can explain various optical effects based on electromagnetic wave theory;

Lecture classes

Lecture sessions consist of the formation of a methodological and scientific approach to the physical laws of technical and technological processes, as well as a scientific worldview through theoretical knowledge and practical skills. Lecture sessions are held in classrooms with a large capacity, equipped with multimedia devices.

Practical exercises

Instructions and recommendations, a set of problems on the organization of practical classes are developed by the professors and teachers of the department. It provides students with methods for solving practical problems and examples on the main lecture topics and problems for independent solution. Textbooks, educational and methodological manuals, lecture texts, handouts, electronic materials are used in mastering practical classes. Practical classes are conducted separately for each academic group in an auditorium equipped with multimedia devices. Classes are conducted using active and interactive methods.

Laboratory classes

Laboratory classes are aimed at developing practical skills and abilities by testing the knowledge (basic physical laws) acquired by students in theoretical and practical classes.

Laboratory classes are conducted in specially equipped rooms assigned to the department.

Independent learning

Students prepare presentations, group work, and abstracts on topics for independent study..

N o	Subject topics	Lectu re hours	Practical training hours	Laborat ory class	Inde pend ent study
Physics 1					
1.	Fundamentals of Kinematics.	2.	2.	2.	6.
2.	Dynamics of a material point. Forces in	2.	2.		6.
3.	Laws of justification in mechanics.	2.			6.
	Dynamics of rotational motion of a rigid body.		2.	2.	

4.	General properties of liquids and gases.	2.		2.	6.
5.	Mechanical oscillations and waves.	2.		2.	6.
6.	Fundamentals of Molecular Kinetic Theory.	2.		2.	6.
7.	Fundamentals of Thermodynamics.	2.	2.		6.
8.	Reversible and irreversible processes.	2.			6.
9.	Fundamentals of Statistical Physics. Real gases.	2.			6.
1	Electrostatic field.	2.	2.		6.
1	Conductors in an electrostatic field.	2.		2.	6.
1	Direct electric current.	2.	2.		6.
Tot		24.	12.	12.	72.
Physics 2					
1.	Magnetic field in vacuum. A current-carrying conductor is in a magnetic field.	2.	2.	2.	6.
2.	Phenomenon of electromagnetic induction.	2.	2.	2.	6.
3.	Electromagnetic field. Maxwell's equations. Electromagnetic waves.	2.			6.
4.	Wave Optics. Interference of light.	2.	2.	2.	6.
5.	Diffraction of light.	2.		2.	6.
6.	Electromagnetic waves in matter. Polarization of light.	2.			6.
7.	Quantum nature of radiation.	2.	2.	2.	6.
8.	Elements of quantum optics.	2.	2.	2.	6.
9.	Atomic Physics.	2.			6.
10.	Elements of quantum physics.	2.	2.		6.
11.	Elements of quantum electronics and physics of new technologies.	2.			6.
12.	Structure and properties of the atomic nucleus.	2.			6.
Total		24.	12.	12.	72.

Main literature

1. Qodirov O. Physics Course Part 1 (mechanics, molecular physics). Training manual. -T., "Science and Technology," 2005, 348 pages.
2. Asatov U.T. "PHYSICS" Textbook. "EFFECT-D," Tashkent, 2023, 184 pages.
3. Saidaxmedova Z.V., Xudayberdiyva A.I. Physics (Electricity and Magnetism) - Study Guide. - "Drops of Thought," Tashkent, 2019, 248 pages.
4. Bozorova S., Kamolov N.K. Physics (Optics, Atomic and Nuclear Physics). Trofimova T.I. Physics Course. Textbook. -M.: "Academy," 2007, 560 p.

Additional literature

- Douglas C. Giancoli, Physics: Principles with Applications, Prentice Hall; 6th edition January 17, 2014, USA.
2. Nazarov U.K., Ikramova H.Z., Tursunmetov K.A. General Physics Course "Mechanics and Molecular Physics" Tashkent, "Uzbekistan," 1992, 279 p..
 3. Sultanov N.A. "Physics Course" T. "Science and Technology" 2007. 304 pages.

4. Nazarov U.K. General Physics Course "Electricity and Electromagnetism" Tashkent, "Uzbekistan" 2002, 320 p.
5. Ulug'murodov N.X., Sodiqova N.B., Tursunova Z.B. "Physics," Textbook, "EFFECT-D," Tashkent, 2021, 316 pages.
6. Qodirov O., Boydedayev A., Physics Course, "Quantum Physics," T, 2005
7. Izbosarov B.F., Kamolov I.R., "Electromagnetism," T. "Economy-Finance" 2006. p. 360.
8. Rasulov E.N., Begimkulov U.Sh. "Quantum Physics" "Science and Technology" 2006. 352 pages.
9. Begimkulov et al. Practicum in Physics (Optics and Quantum Physics), T. "Science and Technology" 2007.
10. Muminov T.M., Khalikulov A.B., Khushmurodov Sh.Kh. Atomic Nucleus and Particle Physics. T. "Science and Technology" 2009. 288 pages.
11. Orifjonov S. "Electromagnetism." Textbook.-"Noshir," Tashkent, 2011, 304 pages.
- Chertov A., Vorobyev A. Collection of Problems in Physics. Textbook -T.: Uzbekistan, 1997.
13. Toshkhonova J.A., Ulmasova M.N., Ismoilov I., Rizayev T., Makhmudova Kh.M., Physics Practicum (Mechanics and Molecular Physics), Tashkent, 2006. 272 pages.
14. Toshkhonova J.A., Komolov J., Makhmudova Kh.M., Rizayev T., Physics Practicum (Electricity and Magnetism), Tashkent, 2006.
15. Ganiev A.G., Normurodov M.T. "Problem Solving in Physics" Publishing House of the National Society of Philosophers of Uzbekistan. Tashkent, 2012, 400 p.
16. Khudayberdiyeva A.I. "Collection of Problems in Physics" Poytaxt exclusive. Tashkent, 2022, 168 pages.
17. Ulugmurodov N.Kh. "Practical Course in Physics," "VNESHINVESTROM," Tashkent, 2015, 347 pages.

Web sites

1. - Government portal of the Republic of Uzbekistan.
2. - National Database of Legislation of the Republic of Uzbekistan.
3. www.phys.ru.
4. www.google.ru.

Contact hours*: You can contact the teacher based on the following schedule for completing independent study assignments, submitting them, and asking questions about necessary information and various materials:

No	Day	Time	Room
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1.	Tuesday	2:00 PM - 4:00 PM	AN-32 1/102
2.	Saturday	10:00 - 12:00	AN-32 1/102