

# COURSE SYLLABUS

## Physics

**Degree of higher education** first (bachelor)

**Specialty** – 182 Consumer industry technologies.

**Course status** – compulsory.

**Instructor:** Department of Applied Physics and Higher Mathematics Kovalchuk O.V., doctor of physical and mathematical sciences Science, Professor.

### 1. Course description

**Semester:** 2.

**Scope:** total number of hours – 180, including: lectures – 24 hours, practical – 24 hours, laboratory – 24 hours, independent work – 108 hours; number of ECTS credits – 6.

**Course objectives – mastering competencies - acquisition of competencies:** ability to abstract thinking, analysis and synthesis; ability to use knowledge and understanding of physics to solve professional problems; ability to use in practice the basic knowledge of mathematics as a mathematical apparatus of physics in the study and research of physical and phenomena and processes; ability to work with scientific equipment and measuring instruments, process and analyze research results; ability to perform theoretical and experimental research independently and as part of a research group.

**Learning outcomes of the course:**

*know:* theoretical foundations of physics and practical methods of solving problems at the level necessary to achieve other results of the educational program; rules for conducting experimental research and methods of processing measurement results; basic safety requirements for experimental research;

*be able:* apply the basic principles of physics to establish, analyze, interpret, explain and classify the essence and mechanisms of various physical phenomena and processes to solve practical problems in physics;

*able to demonstrate:* ability to conduct simple experiments, with further complication of laboratory equipment for a comprehensive study of materials and phenomena;

*solve independently:* use modern information systems and technologies, general and specialized software in professional activities to create physical models.

**Required educational components (prerequisites, co-requisites, post-requisites):** higher and applied mathematics, chemistry.

**Course content: Topic 1.** Mechanics: kinematics, dynamics and conservation laws in mechanics.

**Topic 2.** Mechanical oscillations and waves. **Topic 3.** The ideal gas. Statistical distributions.

**Topic 4.** Thermodynamics. **Topic 5.** . Real gas. Phase transitions. **Topic 6.** Static electric field. **Topic 7.** Direct electric current. **Topic 8.** Magnetism. **Topic 9.** Electrodynamics. **Topic 10.**

Geometric, wave and quantum optics. **Topic 11.** Fundamentals of quantum mechanics and statistics. **Topic 12.** Atomic and nuclear physics.

**Forms of final control:** exam (semester 2).

**Tools for diagnosing learning success:** individual tasks, namely: presentations, essays, calculation works, exercises, tasks, tests, etc., questions for thematic and final control.

**Language of instruction:** Ukrainian.

### 2. Assessment

**Distribution of points received by applicants for higher education**

Credit

*Example 1*

Ongoing assessment and independent work															Thematic control	Exam	Total
T 1	T 2	T 3	T 4	T 5	T 6	ІЗ задачі	ПК	T 7	T 8	T 9	T 10	T 11	T 12	ІЗ задачі			
4	4	5	5	5	5	10	10	4	4	4	4	3	3	10	10	10	100

Distribution of points in the course

Example 2

Activities evaluated in points	T 1	T 2	T 3	T 4	T 5	T 6	T 7	T 8	T 9	T 10	T 11	T 12	Total
Speech at the laboratory work	4	4	5	5	5	5	4	4	4	4	3	3	50
Estimated individual tasks (tasks)	10						10						20
Current control (test)	10						-						10
Modular control (test)	-						10						10
Exam	10												10
<b>Total in the course</b>													<b>100</b>

**Compliance with the scales for assessing the quality of learning material**

Score on the national scale	Points	Assessment on the ECTS scale	Definition
<b>excellent</b>	90-100	<b>A</b>	<b>Excellent</b> (outstanding performance without errors)
<b>good</b>	82-89	<b>B</b>	<b>Very good</b> (above the average standard but with minor errors)
	74-81	<b>C</b>	<b>Good</b> (generally sound work with some errors)
<b>satisfactory</b>	64-73	<b>D</b>	<b>Satisfactory</b> (fair but with significant shortcomings)
	60-63	<b>E</b>	<b>Fair</b> (performance meets the minimum criteria)
<b>unsatisfactory</b>	35-59	<b>FX</b>	<b>Fail</b> (some more work required before the credit can be awarded)
	0-34	<b>F</b>	<b>Fail</b> (considerable further work is required)

3. Course policy:

3.1 Mandatory observance of academic integrity by higher education students, namely:

- independent performance of all activities, tasks, forms of control provided by the working program of this course;
- references to the sources of information if ideas, developments, statements, information are used;
- compliance with the legislation on copyright and related rights;
- providing reliable information about the results of their own educational (scientific, creative) activities, used research methods and sources of information.

3.2 Recognition of learning outcomes obtained in non-formal education is allowed.

3.3 To obtain a positive grade in the course, it is necessary to obtain the minimum number of points for each type of work, which is evaluated in points.

3.4 To obtain a positive assessment of the discipline it is necessary to obtain a minimum number of points for each laboratory work and individual tasks if they are provided in the guidelines for laboratory work.

3.5 In case of untimely performance of works the estimation for such works can be reduced.

3.6 Postponement of delivery / re-submission:

for good reasons (hospital, academic mobility), the work is processed independently and handed over during the semester;

without good reason, the work is processed independently and handed in during the semester but the grade decreases (75% of the possible maximum number of points).

3.7 Missed classes are processed independently with the obligatory registration of the protocol of laboratory work and the abstract on the topic of the missed lecture.

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In case of disagreement with the assessment, the student has the right to appeal the assessment to the head of the department.