



DISCIPLINE ACADEMIC SHEET
ACADEMIC YEAR 2025 – 2026

1. PROGRAMME DATA

1.1. Higher Education Institution	UNIVERSITY OF CRAIOVA
1.2. Faculty	Automation, Computers and Electronics
1.3. Department	Computers and Information Technology
1.4. Field of Study	Computers and Information Technology
1.5. Study level	L(License / Undergraduate)
1.6. Organizational form	IF
1.7. Study Program (name/code) /Qualification	Computers / L2060101010

2. DISCIPLINE DATA

2.1 Discipline Name	Physics I - General Physics						
2.2 Course Activities Holder	Professor Eugen-Mihăiță CIOROIANU, PhD						
2.3. Practical Activities Holder	Professor Eugen-Mihăiță CIOROIANU, PhD						
2.4. Study Year	1	2.5. Semester	1	2.6. Evaluation type	E	2.7. Discipline regime	DOB

3. ESTIMATED TOTAL TIME (hours per semester of teaching activities)

3.1. Number of hours per week	3	in which: 3.2 course	2	3.3. sem.	1
3.4. Total hours of curriculum	42	in which: 3.5 course	28	3.6. sem.	14
3.7. Time distribution - hours/week					hours
Study after manual, course support, bibliography and notes					28
Additional documentation in library, on specialized electronic platforms and field					8
Training seminars / labs, homework, portfolios and essays					14
Tutorial					4
Examinations					4
Other activities.....					-
Total hours per individual activities					58
3.8. Total hours per semester					100
3.9. Number of credits					4

4. PRECONDITIONS (where appropriate)

4.1. of curriculum	•
4.2. of competence	•

5. CONDITIONS (where appropriate)

5.1. of the course	•
5.2. of seminar/ laboratory/project	•

6. COURSE OBJECTIVES – expected learning outcomes that are supported by completing and passing the course

Knowledge	Student/Graduate: 1. The student/graduate identifies and describes basic concepts, principles and methods in physics; 2. The student/graduate explains and interprets theoretical and experimental results in Physics.
Skills (Abilities)	Student/Graduate: 1. The student/graduate uses concepts, principles, and methods from Physics; 2. The student/graduate applies criteria and evaluation methods to identify, model, experiment with, analyze, and estimate, both quantitatively and qualitatively, phenomena and specific processes from the fundamental domain, including digital technologies.
Responsibility and autonomy	Student/Graduate: 1. The student/graduate practices logical reasoning, evaluation, and self-evaluation in making decisions; 2. The student/graduate encourages dialogue, cooperation, respect for others, and multiculturalism.

7. CONTENTS

<i>7.1. Course</i>	The method of implementation	Teaching methods	Allocated time (hours)
1. Kinematics of point particles (framework, position, trajectory, velocity, acceleration, various kinematic laws)	face-to-face	lecture giving, explanation, dialogue	3
2. Dynamics of point particles (Newtonian axiomatic system, central problem of classical mechanics, various classical observables, and local evolution theorems)	face-to-face	lecture giving, explanation, dialogue	3
3. Electrostatics (electric charge, Coulomb's law, electric field intensity, electric flow, Gauss theorem, electric potential)	face-to-face	lecture giving, explanation, dialogue	3
4. Electric current (circuit elements, Ohm's law, Kirchhoff's theorems)	face-to-face	lecture giving, explanation, dialogue	2
5. Magnetostatics (electric current density, Biot-Savart law, magnetic field induction, Gauss law)	face-to-face	lecture giving, explanation, dialogue	3
6. Geometrical optics (Gaussian approximation, reflection and refraction phenomena, spherical dioptrum, mirrors, lens, various types of images)	face-to-face	lecture giving, explanation, dialogue	2
7. Wave optics (wave equation, plane wave solutions, spectrum, interference, coherence, diffraction, polarization)	face-to-face	lecture giving, explanation, dialogue	2
8. Photonics (light quanta, photoelectric, Compton effects, lasers)	face-to-face	lecture giving, explanation, dialogue	2

9. Quantum phenomena (black body radiation, atomic spectra, Stern-Gerlach experiment, Bragg diffraction) and their theoretical approach (principles of quantum mechanics)	face-to-face	lecture giving, explanation, dialogue	2
10. Dirac bra-ket formalism (implementation and various instances)	face-to-face	lecture giving, explanation, dialogue	2
11. Two-state quantum systems (algebraic and geometric implementation-Bloch sphere)	face-to-face	lecture giving, explanation, dialogue	2
12. Elements of quantum computation (single and multiple qubit gates)	face-to-face	lecture giving, explanation, dialogue	2

Bibliography:

1. E.M. Cioroianu, Physics I-General Physics, Lecture Notes 2026
2. S. C. Săraru, Physics-An introductory course (in Romanian), Universitaria Publishing House, Craiova, 2021
3. E. M. Cioroianu, M. T. Miaută, S. C. Săraru, Newtonian mechanics. Laboratory themes (in Romanian), Universitaria Publishing House, Craiova, 2013
4. D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, 12th Edition, John Wiley & Sons, Hoboken, 2021
5. H. Young, R. Freedman, University Physics, 15 th Edition, Pearson, Boston, 2019
6. Bureau International des Poids et Mesures, The International System of Units (SI), 9th edition, 2019, www.bipm.org
7. E. M. Purcell, D. J. Morin, Electricity and magnetism, Cambridge University Press, 2013
8. I. E. Irodov, Basic Laws of Electromagnetism, Mir Publishers, Moscow, 1986
9. I. V. Savelyev, Physics-A General Course, vol. II, Mir Publishers, Moscow, 1989
10. F. L. Pedrotti, L. M. Pedrotti, L. S. Pedrotti, Introduction to Optics, Addison-Wesley, 2006
11. M. Born, E. Wolf, Principles of Optics, Cambridge University Press, Cambridge, 2005
12. F. G. Smith, T. A. King, D. Wilkins, Optics and Photonics: An Introduction, 2 nd Edition, John Wiley & Sons, Hoboken, 2007
13. E. M. Cioroianu, Quantum Mechanics (in Romanian), Universitaria Publishing House, Craiova, 2016
14. M. Nielsen and I. Chuang, Quantum Computation and Quantum Information, 10th Edition, Cambridge University Press, Cambridge, 2010

7.2. Seminar	The method of implementation	Teaching methods	Allocated time (hours)
1. Various types of one-dimensional motions	face-to-face	problem-reformulation, exercise	2
2. Several examples of force configurations and their impact on material bodies	face-to-face	problem-reformulation, exercise	2
3. Electric fields produced by standard static symmetric electric charge configurations	face-to-face	problem-reformulation, exercise	2
4. Magnetic fields produced by standard static symmetric electric current configurations	face-to-face	problem-reformulation, exercise	2
5. Examples of image formation in lens/mirror systems	face-to-face	problem-reformulation, exercise	2
6. Simple computations in instances of light-interferential systems	face-to-face	problem-reformulation, exercise	2

7. Algebraic computations for quantum systems with finitely many quantum states	face-to-face	problem-reformulation, exercise	2
Bibliography:			
1. E.M. Cioroianu, Physics I-General Physics, Problem Sessions 2025			
2. H. Young, R. Freedman, University Physics, 15th Edition, Pearson, Boston, 2020			
3. R. Serway, J. Jewett, Physics for Scientists and Engineers, 10th Edition, Cengage Learning, Boston, 2019			
4. D. Halliday, R. Resnick, J. Walker, Fundamentals of Physics, 12th Edition, John Wiley & Sons, Hoboken, 2021			
5. I.E. Irodov, Problems in Physics, Mir Publishers, Moscow, 1981			

8. Correlating the content of the discipline with the expectations of representatives from the epistemic community, professional associations and representative employers in the field related to the program

- By acquiring the theoretical-methodological concepts and approaching the practical aspects related to Physics I- General Physics, the students, future engineers, achieve a consistent stock of knowledge, in agreement with the competences envisaged in Grid 1M accompanying the program of studies
- The content of the subject Physics I- General Physics ensures the premises necessary to further understanding of the subjects in the specific engineering field of study
- The present subject offers the students the skills to contribute to solving actual problems in real systems

9. EVALUATION

Activity Type	9.1. Evaluation criteria	9.2. Evaluation methods	9.3. Final mark weight
9.4. Course	Logical coherence, fluency, eloquence, and argumentative capacity	Current evaluation (active involvement in lecture sessions)	10%
	Completeness and correctness of knowledge	Final written evaluation	40%
9.5. Seminar	Analysis skills, inherent interpretation skills, originality, and creativity	Current evaluation (active involvement in problem-solving sessions)	15%
	Ability to apply the acquired knowledge to various contexts	Final written evaluation	35%
9.6. Minimum standard of performance			
• Transmission, adaptation, and interpretation of information from Physics exhibiting a medium difficulty level (fundamentals of the physical branches approached in the subject content). • Elaboration of a synthetic scientific report on a free-choice topic included in the subject content.			

Date of Completion	Signature of the Course Activities Holder,	Signature of the Practical Activities Holder,
23.08.2025		

Date of Approval in the Department	Signature of the Department Director,
25.08.2025	Ș.I.dr.ing. Nicolae ENESCU

Date of Approval in the Faculty	Signature of the Dean,
	Prof.dr.ing. Dorin ŞENDRESCU