Identification	Subject (Code, title, credits)	PHSC220, Physics 2, 6 ECTS
	Department	Physics and Electronics
	Program	Undergraduate
	Term	Spring 2026
	Instructor	Aytaj Iskandarova
	E-mail:	aytaj.isgandarova@khazar.org aytajiskandarova@gmail.com
	Phone:	
	Classroom/hours	408 Elshan Mehdiyev str. (Bakikhanov campus)
	Office hours	
Prerequisites	Physics 1	
Language	English	
Compulsory/Elective	Compulsory	
Required textbooks and course materials	Textbooks: [1] - Fundamentals of Physics, Extended (10th ed.), Wiley - Halliday, D., Resnick, R., and Walker, J. - 2013 [2] - Physics for Scientists and Engineers with Modern Physics (10th ed.), Cengage Learning - Serway, R. A., and Jewett, J. W. Jr. - 2018 [3] - University Physics Volume 2. OpenStax - Ling, S. J., Sanny, J., and Moebs, W. - 2016	
Course description	Physics 2 offers a comprehensive introduction to electromagnetism and optics, emphasizing the fundamental interactions of electric charges, fields, and Gauss's Law. The course explores electric potential, capacitance, and circuit dynamics, alongside magnetic fields and the principles of electromagnetic induction. It also examines the properties of light, with a focus on interference, diffraction, and electromagnetic waves. Through the application of these core concepts to practical problems, students develop analytical and critical thinking skills essential for addressing real-world physical challenges.	
Course objectives	• Understand and apply the fundamental principles of electricity and magnetism, including Coulomb's law, Gauss's law, and Ampere's law. • Analyze electric circuits, including resistive, capacitive, and inductive components, using Ohm's law and Kirchhoff's rules. • Explain the behavior of magnetic fields and electromagnetic induction and their applications in real-world devices. • Understand and apply concepts of wave motion, including sound and light waves, interference, diffraction, and polarization. • Develop problem-solving skills in physics-related quantitative and conceptual challenges. • Apply the principles of electromagnetism and wave phenomena to practical and technological applications.	
Learning outcomes	By the end of the course, students will be able to: • Articulate the fundamental principles of electromagnetism, including the properties of electric charge, field theory, and magnetic interactions. • Apply governing laws, such as Gauss's Law and Ampère's Law, to evaluate electric potential, flux, and electromagnetic induction. • Analyze the behavior and operational dynamics of electric circuits through the application of electromagnetic principles. • Demonstrate a comprehensive understanding of the wave nature of light,	

	specifically regarding interference, diffraction, and polarization phenomena. • Solve complex problems in electromagnetism and optics by synthesizing theoretical concepts with analytical techniques. • Validate core competencies through structured evaluations, including periodic quizzes, midterms, and a comprehensive final examination.	

Teaching methods	Case analysis	x
	Group discussion	x
	Lecture	x
	Simulation	x

Evaluation Criteria	Methods	Date/deadlines	Percentage (%)
	Midterm Exam		30
	Attendance	At each lesson	5
	Quiz	Four quizzes during the semester	20
	Activity	During the semester	5
	Final Exam		40
	Total		100

Class Policy	
	• **Preparation for class** The pedagogical structure of this course necessitates diligent individual study and external preparation. Course sessions are designed to emphasize the primary theoretical frameworks introduced in the text. Pre-class engagement with assigned chapters is essential to facilitate a comprehensive understanding of the material. Subsequent to each session, students should synthesize their notes and resolve pertinent problems, case studies, and sample examination questions located at the conclusion of each chapter. • **Withdrawal (pass/fail)** This course strictly adheres to the grading ordinances of the School of Science and Engineering. Consequently, students are required to achieve a minimum threshold of 60% to secure a passing grade. In the event of an unsatisfactory result, the student will be mandated to repeat the course in the following academic term or year. • **Cheating/plagiarism** Any instance of academic dishonesty or plagiarism during Quizzes, Midterms, or Final Examinations will result in the immediate nullification of the assessment. In such cases, the student will automatically be assigned a score of zero (0) without further consideration. • **Professional behavior guidelines** Students are expected to conduct themselves in a manner that fosters a constructive academic and professional environment during instructional hours. Unauthorized discourse and unethical behavior are strictly prohibited. • **Attendance** Students who maintain full attendance for the duration of the course will be awarded 5 marks. Conversely, for every three absences recorded, the student will incur a deduction of 1 mark. • **Quizzes** Four quizzes will be administered throughout the semester, with formal

announcements made in class two weeks prior to the assessment date. The content of each quiz is based on assigned homework problems, which are curated from the questions and problems at the end of each chapter.

- **Activity**
  Students who demonstrate active engagement during the review of previous lessons and proficiently solve problems during seminar sessions will be awarded one activity mark.

Tentative Schedule			
Weeks	Date/Day	Topics	Reference to textbooks
1.	17-02-26	Electric charge. Electric field Problem solving	[1]–p. 609-622, 630-651
2.	24-02-26	Gauss' law Problem solving	[1]–p.659-677 [3]–Ch. 6
3.	03-03-26	Electric potential Quiz 1 – Lesson 1, Lesson 2	[1]–p.685-708 [3]–Ch. 7
4.	10-03-26	Capacitance Problem solving	[1]–p.717-738 [3]–Ch. 8
5.	17-03-26	Current and resistance Problem solving	[1]–p.745-764
6.	24-03-26	Circuits Quiz 2 – Lesson 3, Lesson 4, Lesson 5	[1]–p.771-793 [2]–p.713-725
7.	31-03-26	Magnetic fields Problem solving	[1]–p.803-827 [2]–p.742-762
8.	07-04-26	Midterm exam	
9.	14-04-26	Magnetic fields due to current Problem solving	[1]–p.836-854
10.	21-04-26	Induction and Inductance Problem solving	[1]–p.864-893 [3]–Ch.13, 14
11.	28-04-26	Electromagnetic oscillations and alternating current Quiz 3 - Lesson 9, Lesson 10	[1]–p.903-934
12.	05-05-26	Maxwell's equations; magnetism of matter Problem solving	[1]–p.941-965 [3]–Ch.16
13.	12-05-26	Electromagnetic waves Problem solving	[1]–p.972-999 [3]–Ch.16

14.	19-05-26	Images Quiz 4 - Lesson 12, Lesson 13	[1]–p. 1010-1036 [2]–p.925-960
15.	26-05-26	Interference and diffraction Problem solving	[1]–p.1047-1072, 1081-1107
	TBC	Final exam	

This syllabus is a guide for the course and any modifications to it will be announced in advance.