

Identification	Subject (code, title, credits)	PHSC 112, Physics II 6 ECTS	
	Department	Physics and Electronics	
	Program (undergraduate, graduate)	Undergraduate	
	Term	Fall, 2022	
	Instructor	Assoc. Prof. Dr., V u s a l a E m i n o v a	
	E-mail:	yusaleeminova84@gmail.com	
	Phone:	050 724 14 17	
	Classroom/hours	11 Mehseti str.(Nefthilar campus)	
Office hours	Monday: 11:50-15:10/ Thursday: 11:50-15:10		
Prerequisites	PHSC 111		
Language	English		
Compulsory/ Elective	Compulsory		
Required textbooks and course materials	Fundamentals of Physics Extended 8th Edition by Halliday, Resnick, and Serway, Walker John Wiley, 2011 https://drive.google.com/folderview?id=0B2q6eS6QaN-pZXRDQ3VCZ0xQYmM&usp=sharing - Go to this page to download textbook Class assignments: www.edmodo.com		
Course outline	Physics II serves as a calculus based introduction to Electromagnetism. Students will investigate the principles of introductory physics through lectures, seminars and homework problems. Course will cover these topics- Electric Charge and Electric Field. Gauss Law, Electric Potential. Capacitance, Electric Current and Resistance, Circuits, Magnetism. Electromagnetic Induction, Electromagnetic Waves, Interference and the Wave Nature of Light. Critical thinking about physics problems is emphasized.		
Course objectives	To develop understanding the concepts in electricity and magnetism, reinforce general problem solving skills. Students should be able to apply the basic laws of electricity and magnetism to solve simple problems concerning the motion and distribution of charges.		
Learning outcomes	Understanding topics related to Electric and Magnetic fields. Apply the conceptual themes of Electromagnetism. Understand methods for solving electromagnetic problems in related fields of Engineering. To analyze simple Electrical Circuits. Application of fundamental methods of Circuit theory. To apply gained knowledge into practical work in Engineering.		
Teaching methods	Lecture		<input type="checkbox"/>
	Group discussion		<input type="checkbox"/>
	Experiential exercise		<input type="checkbox"/>
	Case analysis		<input type="checkbox"/>
	Quiz, Classroom Exams		<input type="checkbox"/>
	Course paper		<input type="checkbox"/>
	Others		<input type="checkbox"/>
Evaluation	Methods	Date/deadlines	Percentage (%)
	Midterm Exam		30
	Attendance	At each lesson	5
	Quizzes	During the semester	20
	Activity	During the semester	10
	Final Exam		35
	Total		100

Policy	<ul style="list-style-type: none"> ▪ Preparation for class The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems and cases from the end of the chapter and sample exam questions. ▪ Withdrawal (pass/fail) This course strictly follows grading policy of the School of Science and Engineering. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year. ▪ Cheating/plagiarism Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations. ▪ Professional behavior guidelines The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited. <p>Attendance Students who attend the whole classes will get 5 marks. For three absence student loses 1 mark.</p> <ul style="list-style-type: none"> ▪ Activity Students who will be active during discussion of past lessons and who will be solve homework problems in a seminar will be awarded with one activity mark. ▪ Quizzes <ul style="list-style-type: none"> ▪ There will be 2 quizzes examination during the semester. The quizzes will be announced in the classroom two weeks before. Quiz is based on homework problems. The homework problems will be selected from questions and problems in the end of each chapter. The number of homework problems will be announced after finishing each chapter. ▪ The students who able to pass midterm and first quiz with max points automatically get max 10 point for the second quiz.
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Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook
1	19.09.2022 21.10.2022	<p>Electric Charge The Origin of Electricity, Types of electric charge</p> <ul style="list-style-type: none"> - Forces among two charges (Coulomb's law) - Charge quantization - Charge conservation <p>Charged Objects and the Electric Force, Conductors and Insulators, Charging by Contact and Induction, Coulomb's Law.</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 21.</p> <p>2. Handnotes given by teacher</p>

2	26.09.2022 28.09.2022	<p>Electric Field</p> <p>The Electric Field, Electric Field Lines, The Electric Field Inside a Conductor.</p> <p>Calculate the electric field generated by a point charge.</p> <ul style="list-style-type: none"> - Using the principle of superposition determine the electric field created by a collection of point charges as well as continuous charge distributions. - Define the notion of an “electric dipole”. Determine the net force, the net torque, exerted on an electric dipole by a uniform electric field, as well as the dipole potential energy 	<p>1. Fundamentals of Physics by Halliday, Chapter 22.</p> <p>2. Handnotes given by teacher.</p>
3.	03.10.2022 05.10.2022	<p>Electric Potential Energy and the Electric Potential</p> <p>Potential Energy, The Electric Potential Difference, The Electric Potential Difference Created by Point Charges, Equipotential Surfaces</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 24.</p> <p>2. Handnotes given by teacher.</p>
4.	10.10.2022 12.10.2022	<p>Capacitance</p> <p>Capacitor; Capacitance, Capacitors in Parallel and in Series Potential Energy and Energy Density, Capacitance with a Gauss' Law with a Dielectric Equivalent capacitance.</p> <ul style="list-style-type: none"> -Energy stored in a capacitor. 	<p>1. Fundamentals of Physics by Halliday, Chapter 25.</p> <p>2. Handnotes given by teacher</p>
5.	17.10.2022 19.10.2022	<p>Current and Resistance</p> <p>Current, Current Density, Drift Speed, Resistance of a Conductor, Ohm's Law, Resistivity of a Metal, Power, Resistive Dissipation, Semiconductors, Superconductors</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 26.</p> <p>2. Handnotes given by teacher</p>
6.	24.10.2022 26.10.2022	<p>MiddermExam</p> <p>Problem solving</p>	
7.	31.10.2022 02.11.2022	<p>Circuits</p> <p>Electromotive force (emf), Ideal and real emf devices, Series wiring, Parallel wiring, Circuits partially series and partially parallel, Internal resistance.</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 27.</p> <p>2. Handnotes given by teacher</p>
8.	07.11.2022 09.11.2022	<p>Circuits</p> <p>RC circuits, charging and discharging of a capacitor, Measurement of current, Kirchhoff's Rules, Capacitors in series and parallel</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 27.2. Handnotes given by teacher</p>
9.	14.11.2022 16.11.2022	<p>Magnetic Forces and Magnetic Fields</p> <p>Magnets and Magnetic Fields, Force on a Moving Charge, Motion of a Charged Particle in a Magnetic Field, Mass spectrometer. Hall effect, Force on a Current, Torque on Coil, Magnetic Fields by Currents, Magnetic Materials</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 28.</p> <p>2. Handnotes given by teacher</p>
10.	21.11.2022 23.11.2022	<p>Quiz</p> <p>Problem solving</p>	

11	28.11.2022 30.11.2022	<p style="text-align: center;">Magnetic Forces and Magnetic Fields</p> <p>Hall effect, Force on a Current, Torque on Coil, Magnetic Fields by Currents, Magnetic Materials</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 28.</p> <p>2. Handnotes given by teacher</p>
12.	05.12.2022 07.12.2022	<p style="text-align: center;">Magnetic Fields Due to Currents</p> <p>The Biot-Savart Law, Magnetic Field of a Long Straight Wire, Magnetic Field of a Circular Arc, Force Between Parallel Currents, Ampere's Law, Fields of a Solenoid and a Toroid.</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 29.</p> <p>2. Handnotes given by teacher</p>
13	12.12.2022 14.12.2022	<p style="text-align: center;">Induction and Inductance</p> <p>Magnetic Flux, Faraday's Law, Lenz's Law, Emf and the Induced Electric Field, Self-Induction, Mutual Inductance</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 30.</p> <p>2. Handnotes given by teacher</p>
14	19.12.2022 21.12.2022	<p style="text-align: center;">Images</p> <p>Two Types of image, A Common Mirage, Plane Mirrors, Extended Objects, Mirror Maze, Spherical Mirrors</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 36.</p> <p>2. Handnotes given by teacher</p>
15	26.12.2022 28.12.2022	<p style="text-align: center;">Images</p> <p>The nature of Light. The Interference of Light.</p>	<p>1. Fundamentals of Physics by Halliday, Chapter 37.</p> <p>2. Handnotes given by teacher</p>
		Final Exam	

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

