Identification	**Subject (code, title, credits)**	PHSC 112, Physics II - 6 ECTS credits	
	Department	Physics and Electronics	
	Program (undergraduat, graduate)	Undergraduate	
	Academic semester	Fall 2021	
	Lecturer	Ph.D Ahmad Asimov	
	E-mail:	fizikasimov@gmail.com	
	Phone:	+994124211093 (daxili255)	
	Lecture room/Schedule	302 N Monday/Wednesday	
	Office hours	Tuesday: 15:00-16:00/ Thursday: 15:00-16:00	
Prerequisites	PHSC 111		
Language	English		
Compulsory	Compulsory		
Required textbooks and course materials	1. **Serway, Raymond, and Belchner, Robert. Physics for Scientists and Engineers with Modern Physics, 5th Edition. Orlando: Harcourt College Publishing, 2000.** 2. **Fundamentals of Physics Extende d 8th Edition by Halliday, Resnick, and Walker John Wiley, 2011.**		
Course outline	This course is a study of classical electricity and magnetism from a theoretical and engineering application viewpoint. Students will investigate the principles of introductory physics through lectures, seminars and homework problems. University Physics II introduces electrical and magnetic phenomena in nature, including the concepts of electrical charges, electric and magnetic fields, the application of Gauss' Law, electric potential, Capacitance, Electric Current and Resistance, Circuits, Magnetism. Electromagnetic Induction, Electromagnetic Waves, Interference and the Wave Nature of Light.		
Course objectives	Develop grasping the concepts in electricity and magnetism, reinforce general problem solving skills and reinforce conceptual understanding through the use of problem solving skills.		
Learning outcomes	This is a calculus-based introductory physics course. After taking this course, students are expected to have gained theoretical and engineering of basic topics related to electricity and magnetism, Interference and the Wave Nature of Light, Electromagnetic Waves, Electrical Circuit.		
Teaching methods	**Lecture**		☑
	Group discussion		☑
Evaluati on	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Class Participation	At each lesson	5
	Quizzes	During the semester	20
	Activity	During the semester	5
	Final Exam		40
	Total		100

Policy	
	▪ **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. **Quizzes** ▪ There will be a quiz examination per two weeks. The quizzes will be announced in the classroom two weeks before. Quiz is from homework problems. The homework problems will be selected from questions and problems in the end of each chapter. The No. of homework problems will be announced after finishing each chapter.

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook
1	4-6 Oktober 2021	**Electric Charge** The Origin of Electricity, Types of electric charge - Forces among two charges (Coulomb's law) -Charge quantization, Charge conservation Charged Objects and the Electric Force, Conductors and Insulators, Charging by Contact and Induction, Coulomb's laws	Chapter 21
2	11-13 Oktober 2021	**Electric Field** The Electric Field, Electric Field Lines, The Electric Field Inside a Conductor. Calculate the electric field generated by a point charge. - Using the principle of superposition determine the electric field created by a collection of point charges as well as continuous charge distributions. -Once the electric field at a point P is known we will	Chapter 22

		be calculate the electric force on any charge placed at P -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	
	18-20 Oktober 2021	***Quiz,*** problem solving	
3	25 Oktober 2021	**Electric Fields 2: Gauss's Law** Mathematical derivation of Gauss's Law, Applications of Gauss's Law. An infinite, uniformly charged insulating plane. An infinite, uniformly charged insulating rod. A uniformly charged spherical shell. A uniform spherical charge distribution.	Chapter 23
4	27 Oktober 2021	**Electric Potential Energy and the Electric Potential** Potential Energy, The Electric Potential Difference, The Electric Potential Difference Created by Point Charges, Equipotential Surfaces	Chapter 24
5	1 November 2021	***Quiz,*** problem solving	
	3-8 November 2021	**Capacitance** Capacitor; Capacitance, Capacitors in Parallel and in Serie Potential Energy and Energy Density, Capacitance with a Gauss' Law with a Dielectric Equivalent capacitance. -Energy stored in a capacitor. -Behavior of an insulator (a.k.a. dielectric) when placed in electric field created in the space between the plates of a ca Gauss' law in the presence of dielectrics.	Chapter 25 s, Dielectric, the pacitor. -
6	10 November 2021	**Current and Resistance** Current, Current Density, Drift Speed, Resistance of a Conductor, Ohm's Law, Resistivity of a Metal, Power, Resistive Dissipation, Semiconductors, Superconductors	Chapter 26
7	15-17 November 2021	***Quiz,*** problem solving	
		Midterm exam	
8	22-24 November 2021	**Circuits** Electromotive force (emf), Ideal and real emf devices, Series wiring, Parallel wiring, Circuits partially series and partially parallel, Internal resistance	Chapter 27 es y

9	29 November 2021	**Circuits** RC circuits, charging and discharging of a capacitor, Measurement of current, Kirchhoff's Rules, Capacitors in series and parallel	Chapter 27
10	1 December 2021	**Magnetic Forces and Magnetic Fields** 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	Chapter 28
11	6 December 2021	**Magnetic Forces and Magnetic Fields** Hall effect, Force on a Current, Torque on Coil, Magnetic Fields by Currents, Magnetic Materials	Chapter 28
	8 December 2021	**Quiz,** problem solving	
12	13 December 2021	**Magnetic Fields Due to Currents** 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	Chapter 29
13	15 December 2021	**Induction and Inductance** Magnetic Flux, Faraday's Law, Lenz's Law, Emf and the Induced Electric Field, Self-Induction, Mutual Inductance	Chapter 30
	20 December 2021	**Quiz,** problem solving	
14	22 December 2021	**Induction and Inductance** Magnetic Flux, Faraday's Law, Lenz's Law, Emf and the Induced Electric Field, Self-Induction, Mutual Inductance	Chapter 30
15	27 December 2021	**Images** Two Types of image, A Common Mirage, Plane Mirrors, Extended Objects, Mirror Maze, Spherical Mirrors	Chapter 34
	29 December 2021	**Images** Focal Points of Spherical Mirrors, Images from Spherical Mirrors, Spherical Refracting Surfaces, Thin Lenses, Optical Instruments, Simple magnifying lens, Compound microscope, Refracting telescope	Chapter 34
		Final Exam	

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