Identification	**Subject (code, title, credits)**	**PHSC 112 Physics-2, 6 ECTS**	
	Department	Physics and Electronics	
	Program	Undergraduate	
	Term	Spring, 2020	
	Instructor	Dr. Fakhranda Alimardanova	
	E-mail:	falimardanova@khazar.org	
	Phone:	+99412 4211093 (ext. 232)	
	Classroom/hours	41 Mehseti Str. (Neftchilar campus)	
	Office hours	Tuesday: 15:00-16:00/ Thursday: 15:00-16:00	
Prerequisites	PHSC 111		
Language	English		
Compulsory/Elective	Compulsory		
Required textbooks and course materials	**Fundamentals of Physics Extended 8th Edition by Halliday, Resnick, and 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**		☑
	Group discussion		☑
	Experiential exercise		☐
	Case analysis		☑
	Quiz, Classroom Exams		☑
	Course paper		☑
	Others		☑
Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Case studies		
	Class Participation	At each lesson	5
	Quizzes	During the semester	20
	Activity		5
	Presentation	During the semester	5
	Final Exam		35
	Others		
	Total		100

Policy	▪ Use of cell phones and any other electronic devises is prohibited. ▪ **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	12-14 February 2020	**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 Law.	Chapter 21
2	19-21 February 2020	**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 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	Chapter 22
	26 February 2020	***Quiz,*** problem solving	
3	28 February 4 March 2020	**Electric Fields 2: Gauss's Law** Mathematical derivation of Gauss's Law, Applications of Gauss's	Chapter 23

		Law. An infinite, uniformly charged insulating plane. An infinite, uniformly charged insulating rod. A uniformly charged spherical shell. A uniform spherical charge distribution.	
4	6-11 March 2020	**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	13 March 2020	***Quiz,*** problem solving	
	18 March 2020	**Capacitance** Capacitor; Capacitance, Capacitors in Parallel and in Series, Potential Energy and Energy Density, Capacitance with a Dielectric, Gauss' Law with a Dielectric Equivalent capacitance. -Energy stored in a capacitor. -Behavior of an insulator (a.k.a. dielectric) when placed in the electric field created in the space between the plates of a capacitor. -Gauss' law in the presence of dielectrics.	Chapter 25
6	25 March 2020	**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	27 March 2020	***Quiz,*** problem solving	
	April 2020	**Midterm exam**	
8	3-8 April 2020	**Circuits** Electromotive force (emf), Ideal and real emf devices, Series wiring, Parallel wiring, Circuits partially series and partially parallel, Internal resistance	Chapter 27
9	10-15 April 2020	**Circuits** RC circuits, charging and discharging of a capacitor, Measurement of current, Kirchhoff's Rules, Capacitors in series and parallel	Chapter 27
10	17-22 April 2020	**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	24-29 April 2020	**Magnetic Forces and Magnetic Fields** Hall effect, Force on a Current, Torque on Coil, Magnetic Fields by Currents, Magnetic Materials	Chapter 28
	April 2020	**Quiz,** problem solving	
12	1 May 2020	**Magnetic Fields Due to Currents**	Chapter 29

		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	
13	6 May 2020	**Induction and Inductance** Magnetic Flux, Faraday's Law, Lenz's Law, Emf and the Induced Electric Field, Self-Induction, Mutual Inductance	Chapter 30
	8 May 2020	**Quiz,** problem solving	
14	13-15 May 2020	**Induction and Inductance** Magnetic Flux, Faraday's Law, Lenz's Law, Emf and the Induced Electric Field, Self-Induction, Mutual Inductance	Chapter 30
15	20-22 May 2020	**Images** Two Types of image, A Common Mirage, Plane Mirrors, Extended Objects, Mirror Maze, Spherical Mirrors	Chapter 34
	27-29 May 2020	**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.