King Abdullah II School of Engineering
كليـــــة الملك عبد الله الثاني للهندســـة

COURSE OUTLINE

Course Code	20142		
Course Title	Physics (2)		
Course Prerequisite(s)	20141 Physics (1)		
Credit Hours	3		
Course Type	Lecture		
Course Delivery Method	Face-to-Face		
Required or Elective	Mandatory for all engineering programs and computer science program		
Semester	Second semester 2023/2024		
Instructor Name	Yahya Al-Khatatbeh		
Instructor's email	y.alkhatatbeh@psut.edu.jo		
Instructor's Office Number			
Course Schedule	Sunday/Tuesday/Thursday (11:00-12:00, 12:00-1:00) and Monday/Wednesday (12:30-2:00)		
Office Hours	Sunday/Tuesday/Thursday (10:00-11:00), Monday/Wednesday (11:30-12:30), and by appointment		
Assessment Tools & Grading Policy	Assessment Tool	Weight	Additional Information
	First Exam	N/A	
	Second Exam	N/A	
	Midterm Exam	30%	
	Final Exam	40%	
	Homework	12%	Number of counted HWs: 5
	Quiz(zes)	18%	Number of counted quizzes: 4
	Project(s)	N/A	
	Other	N/A	
Catalog Description	Electric Fields, Gauss's Law, Electric Potential, Capacitance and Dielectrics, Current and Resistance, Direct-Current Circuits, Magnetic Fields, Sources of Magnetic Fields, Faraday's Law, Inductance.		
General Course Objectives	This course aims to enable students to understand concepts and phenomena and solve problems in electricity and magnetism based on fundamental laws of physics and provide a basic understanding of electric circuits.		
Textbook and Related Course Materials	1. Physics for Scientists and Engineers with Modern Physics, by Serway and Jewett, 9th Edition 2. PSUT e-learning: https://elearning.psut.edu.jo		
Topics Covered and Level of Coverage	Chapter 23: Electric Fields - Part I		Week 1
	Chapter 23: Electric Fields- Part II		Week 2
	Chapter 24: Gauss's Law - Part I		Week 3
	Chapter 24: Gauss's Law- Part II		Week 4
	Chapter 25: Electric Potential- Part I		Week 5
	Chapter 25: Electric Potential- Part II Chapter 26: Capacitance and Dielectrics- Part I		Week 6
	Chapter 26: Capacitance and Dielectrics- Part II		Week 7
	Chapter 27: Current and Resistance Chapter 28: Direct-Current Circuits- Part I		Week 8
	Chapter 28: Direct-Current Circuits- Part II		Week 9
	Chapter 29: Magnetic Fields- Part I		Week 10
	Chapter 29: Magnetic Fields- Part II Chapter 30: Sources of the Magnetic Field- Part I		Week 11
	Chapter 30: Sources of the Magnetic Field- Part II		Week 12
	Chapter 31: Faraday's Law		Week 13
	Chapter 32: Inductance		Week 14
Expected Level of Proficiency for Students Entering the Course	Mathematics	Good	
	Physics	Good	
	Technical writing	Good	
	Computer programming	N/A	

Materials Available to Instructor, Students & Department at End of Course		Student	Department	Instructor
	Course Outline	✓	✓	✓
	Lecture Notes	✓	✓	✓
	Samples of Students' Work		✓	✓
	Course Assessment by Students (CAS)		✓	✓
	Course Assessment by Faculty (CAF)		✓	✓

No	Course Learning Outcomes (CLOs)	Student Outcomes (SOs)
1	Provide and define the fundamental properties of the electric charge, solve technical problems associated with the electrostatic force (Coulomb force), the electric force field, Gauss's Law, the electric potential, and potential difference, within a framework of distributed symmetric charge distributions, using calculus.	1
2	Define electric capacitance and solve technical problems associated with capacitors of various symmetries, capacitors in series and parallel combinations, and the microscopic effect of dielectric materials on capacitance and stored energy.	1
3	Define electric current, and current density, and solve technical problems involving DC networks of resistors, batteries, and capacitors, Ohm's Law, Kirchhoff's Laws, and RC charging and decay circuits.	1
4	Define the magnetic field and magnetic flux, and solve technical problems associated with the effect of static, non-uniform, and uniform magnetic fields on moving charges and current-carrying wires, loops, and the magnetic dipole.	1
5	Calculate the magnitude and direction of the magnetic field for symmetric current distributions using the Law of Biot-Savart and Ampere's Law, and state the limitations of Ampere's Law.	1
6	State Faraday's Law of Induction with Lenz's Law and use these equations to solve technical problems associated with induction.	1

ABET – Student Outcomes (1-7)

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

3. an ability to communicate effectively with a range of audiences.

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.