MUTAH UNIVERSITY
College of Science
Department of Physics

Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0302102	General Physics (2)	3	3T

INSTRUCTOR/COORDINATOR	
Name	----------
Email/Office	_____
Office Hours	----------
Classroom/Time	----------

TEXTBOOK	
Title	Physics for Scientists and Engineers with Modern Physics
Author/Year/Edition	Raymond A. Serway and John W. Jewett, 2004, 6th edition
Other Supplemental Materials	
Title	Calculus with analytic geometry
Author/Year/Edition	D. Halliday, R. Resnick, J. Walker, 1991,5th edition

SPECIFIC COURSE INFORMATION
A. Brief Description of the Content of the Course (Catalog Description)
This course covers the following topics: Electric Field, Gauss's Law, Electric Potential, Capacitors and Dielectric, Current and Resistance, DC Circuits, Magnetic Field, Sources of Magnetic Field, Electromagnetic Induction and Faraday's Law.
B. Pre-requisites (P) or Co-requisites (C)
General Physics (1) (0302101) **(P)**
C. Course Type (Required or Elective)
Required
SPECIFIC GOALS
A. Course Learning Objectives (CLOs)

CLO1: To provide an in-depth understanding of the basic laws governing electrical phenomena and a brief survey of 20th century physics [1]. **CLO2**: To introduce students to the use of scaling arguments, dimensional analysis and simplification/approximation for physical science problem solving [1]. **CLO3**: To ensure facility with the relevant subset of topics on the MCAT [1]. **CLO4**: To provide practical knowledge of the fundamentals of instrumentation and techniques used in the biological and medical sciences [1]**.**

B. Student Learning Outcomes (SOs) Addressed by the Course

1	2	3	4	5	6	7
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BRIEF LIST OF TOPICS TO BE COVERED		
List of Topics	**No. of Weeks**	**Contact Hours**
Chapter 1: Electric Fields; Properties of Electric charges, Charging objects by induction, Coulomb's law, the electric field , electric field of a continuous charge distribution, electric field lines, electric fields and conductors, motion of charged particles in a uniform electric field.	2	6
Chapter 2: Gauss's Law; Electric flux, Gauss's law, applications of Gauss's law.	2	6
Chapter 3: Electric Potential; Electric potential energy and potential difference, relation between electric potential and electric field, electric potential due to point charges, potential due to continuous charge distribution, equipotential surfaces, obtaining electric field from electric potential, electrostatic potential energy.	2	6
Chapter 4: **Capacitance and Dielectric;** Capacitors, determination of capacitance, capacitors in series and parallel, electric energy storage, dielectrics.	1	3
Chapter 5: Current and Resistance; The electric battery, electric current, Ohm's law, resistivity, electric power, drift velocity.	1	3
Chapter 6: Dielectric Current Circuits; EMF and terminal voltage, resistors in series and parallel, Kirchhoff's rules, series and parallel EMFs, RC circuits.	2	6
Chapter 7: Magnetic Fields; Magnets and the magnetic fields, electric currents produce magnetic fields, force on electric current in magnetic field, force on electric charge in magnetic field, torque on a current loop, discovery and properties of the electron, the Hall effect, mass spectroscopy	1	3
Chapter 8: Source of Magnetic Field; Magnetic field due to straight wire, forces between two parallel wires, Ampère's law, the magnetic field of a solenoid and a toroid, Biot-Savart law.	2	6

Chapter 9: Faraday's Law; Induced EMF, Faraday's law of induction; Len's law, EMF induced in moving conductor, a changing magnetic flux produces an electric field.	1	3
Total	*14*	*42*

EVALUATION		
Assessment Tool	**Due Date**	**Weight (%)**
Mid Exam	According to the university calendar	30
Course Work (Homework's, Quizzes, Projects, …etc.)	One week after being assigned	20
Final Exam	According to the university calendar	50

ABET's Students Learning Outcomes (Criterion # 3)

	Relationship to program outcomes	
ABET 1-7		**Electrical Engineering Student Outcomes**
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
3.		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