MUTAH UNIVERSITY
College of Science
Department of Physics

Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0302101	General Physics (1)	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 is an introductory course in Newtonian mechanics with topics include: kinematics in one and two dimensions, dynamics (Newton's laws of motion), Newton's laws in circular motion, work and energy, collisions, rotational motion and equilibrium of rigid bodies.
B. Pre-requisites (P) or Co-requisites (C)
None
C. Course Type (Required or Elective)
Required
SPECIFIC GOALS
A. Course Learning Objectives (CLOs)
CLO1: To build up an understanding of fundamental physical principles [1]. **CLO2**: To build up a basic understanding of when and where specific physical principles apply [1].

CLO3: To build up an understanding of how physical principles are applied in everyday life and engineering [1]. **CLO4**: To build up basic skills necessary for solving problems with practical applications by using physical principles [1]. **CLO5**: To equip students with the basic skills necessary for understanding of physical principles in terms of multiple representations: graphs, diagrams, equations [1].

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

1	2	3	4	5	6	7
√						

BRIEF LIST OF TOPICS TO BE COVERED		
List of Topics	**No. of Weeks**	**Contact Hours**
Chapter 1: Physics and Measurement; Standard of length, mass, and time., Dimensional analysis, Conversion of units.	0.5	2
Chapter 2: Motion in One Dimension; Position, velocity and speed, Instantaneous velocity and speed, Acceleration, Motion diagrams, One-dimensional motion with constant acceleration, Freely falling objects.	2	4
Chapter 3: Vectors; Coordinate systems, Vector and scalar quantities, Some properties of vectors, Components of a vector and a unit vectors, Dot product and Cross product	2	4
Chapter 4: **Motion in Two Dimensions;** The Displacement, velocity and acceleration vectors, Two-dimensional motion with constant acceleration, Projectile motion, Uniform circular motion, Tangential and radial acceleration.	1	3
Chapter 5: The Laws of Motion; The concepts of force, Newton's first law and inertial frames, Mass, Newton's second law, The gravitational force and weight, Newton's third law, Some applications of Newton's laws.**,** Forces of friction.	1.5	5
Chapter 6: Circular Motion; Newton's second law applied to uniform circular motion, Non uniform circular motion.	0.5	2
Chapter 7: Energy and Energy Transfer; Work done by a constant force, The scalar product of two vectors, Work done by a varying force, energy and the work-kinetic energy theorem, The non-isolated system – Conservation of energy, Situations involving kinetic friction, Power.	1.5	5
Chapter 8: Potential Energy; Potential energy of a system, The isolated system – conservation of mechanical energy, Conservative and non-conservative forces, Changes in mechanical energy for non-conservative, Relationship between conservative forces and potential energy.	1.5	5

Chapter 9: Linear momentum and Collisions; Linear momentum and its conservation, Impulse and momentum, Collisions in one dimension, Two-dimensional collisions, The center of mass.	1	3
Chapter 10: Rotation of a Rigid Object About a Fixed Axis; Angular position, velocity and acceleration, Rotational kinematics: rotational motion with constant angular acceleration**,** Angular and linear quantities, Rotational kinetic energy, Calculation of moments of inertia, Torque, Relationship between torque and angular acceleration	1	3
Chapter 11: Angular Momentum; The Vector Product and Torque, Angular Momentum**,** Angular Momentum of a Rotating Rigid Object, Conservation of Angular Momentum, The Motion of Gyroscopes and Tops, Angular Momentum as a Fundamental Quantity	1	3
Chapter 12: Static Equilibrium and Elasticity; The Conditions for Equilibrium, More on the Center of Gravity, Examples of Rigid Objects in Static Equilibrium., Elastic Properties of Solid.	0.5	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