



Engineering Program

Specialization	Engineering Program Requirements
Course Number	21302111
Course Title	General Physics
Credit Hours	(3)
Theoretical Hours	(2)
Practical Hours	(2)



Brief Course Description:

- ❖ This is an introductory course in physics. The physical concepts to be studied includes: vectors, motion in one dimension, motion in two dimensions, the laws of motion, applications of Newton's laws, circular motion, energy and energy transfer, potential energy, linear momentum, electricity, electrical potential, capacitance, current and resistance .

Course Objectives:

By the end of the course the students should be able to:

1. Become familiar with the basic physical concepts in mechanics, and electricity.
2. Apply conservation laws.
3. Provide a description of how to solve a problem, justifying their choices.
4. Provide different representations for a problem (verbal, graphical, vectors, diagrams, or equations).



Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed (hours)
1.	Vectors	<ul style="list-style-type: none"> ▪ Coordinate Systems. ▪ Vector and Scalar Quantities. ▪ Some Properties of Vectors. Components of a Vector and Unit Vectors. 	
2.	Motion in One Dimension	<ul style="list-style-type: none"> ▪ Displacement, Velocity, and Speed. ▪ Instantaneous Velocity and Speed. ▪ Acceleration. ▪ One-Dimensional Motion with Constant Acceleration. Freely Falling Objects. 	
3.	Motion in Two Dimensions	<ul style="list-style-type: none"> ▪ The Displacement, Velocity, and Acceleration Vectors. ▪ Two-Dimensional Motion with Constant Acceleration. ▪ Projectile Motion. ▪ Uniform Circular Motion. Tangential and Radial Acceleration. 	
4.	The Laws of Motion	<ul style="list-style-type: none"> ▪ The Concept 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. 	
5.	Circular Motion and Other Applications of Newton's Laws	<ul style="list-style-type: none"> ▪ Newton's Second Law Applied to Uniform Circular Motion. Non uniform Circular Motion. 	
6.	Energy and Energy Transfer	<ul style="list-style-type: none"> ▪ Work Done by a Constant Force. 	

	(Work & Energy)	<ul style="list-style-type: none"> ▪ The Scalar Product of Two Vectors. ▪ Work Done by a Varying Force. ▪ Kinetic Energy and the Work-Kinetic Energy Theorem. Power. 	
7.	Potential Energy	<ul style="list-style-type: none"> ▪ Potential Energy of a System. ▪ The Isolated System-Conservation of Mechanical Energy. Conservative and Non-conservative Forces. 	
8.	Linear Momentum and Collisions	<ul style="list-style-type: none"> ▪ Linear Momentum and Its Conservation. ▪ Impulse and Momentum. ▪ Collisions in One Dimension. ▪ Two-Dimensional Collisions. The Center of Mass. 	
9.	Electricity	<ul style="list-style-type: none"> ▪ Properties of electric charges ▪ Insulator and conductor ▪ Coulomb's law . ▪ The electric field ▪ Electric field lines 	
10.	Electrical potential	<ul style="list-style-type: none"> ▪ Potential difference ▪ Potential difference in a uniform electric field ▪ Electric potential and potential energy due to point charges 	
11.	Capacitance	<ul style="list-style-type: none"> ▪ Capacitance ▪ Combinations of capacitors ▪ Energy stored in capacitor 	
12.	Current and resistance	<ul style="list-style-type: none"> ▪ Electric current ▪ Resistance and ohm's law ▪ Electrical energy and power ▪ Resistors in series and in parallel ▪ Kirchoff's rules 	

Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	--/--/----
	Second Exam	20%	--/--/----
	Final Exam	50%	--/--/----
Homework and Projects		10%	

Teaching Methodology:

- ❖ Lectures and help sessions

Text Books & References:

References

1. Raymond A. Serway and John W. Jewett, "Physics for scientists and Engineers", 7th edition, Thomson Brooks Publisher, 2007.
2. David Halliday, Robert Resnick, and Jearl Walker, "Fundamentals of Physics Extended", 8th edition, John Wiley & Sons, 2008.



Engineering Program

Specialization	Engineering Program Requirements
Course Number	21302112
Course Title	General Physics lab
Credit Hours	(1)
Theoretical Hours	(0)
Practical Hours	(3)



Brief Course Description:

- ❖ In this course, the student performs thirteen experiments in mechanics and temperature.

Course Objectives:

By the end of the course the students should have:

1. Improved their skill and confidence in the acquisition and analysis of experimental data.
2. Improved their ability to record their work concisely and precisely.
3. Improved the ability to identify the main sources of uncertainties in measurements.
4. Understand physics phenomena treated in the lecture course.

Detailed Course Description:

Unit Number	Unit Name	Unit Content	Time Needed
1.	Significant Figures & Errors		
2.	Measurements & Uncertainties		
3.	Vectors (Equilibrium Of Forces)		
4.	Force & Motion		
5.	Rectilinear Of Kinematics of Motion		
6.	Friction		
7.	Centripetal Force		
8.	Conservation Of Linear Momentum (Collision)		
9.	Ohm's law		
10.	Wheatstone bridge		

Evaluation Strategies:

Exams		Percentage	Date
Lab. Reports		30%	
Mid-term Exam (Practical)		20%	
Final Practical Exam		50%	

Teaching Methodology:

- ❖ Laboratory.

Text Books & References:

References:

1. General physics manual, AL – Balqa Applled University, 2002.
2. John E. Williams, “Modern Physics: Exercises and Experiments in Physics”, Holt Rinehart & Winston, 1984.

