

Subject Code: 1ET4000104	Subject Title: Basic Physics
Pre-Requisite	--

RATIONALE:

As Physics is the mother of all engineering disciplines, students must have some basic knowledge on physics to understand their core engineering subjects more comfortably. Accordingly, in reviewing the syllabus, emphasis has been given on the principles, laws, working formulae and basic ideas of physics to help them study the core subjects. Complicated derivations have been avoided because applications of the laws and principles of physics are more important for engineering students.

As Physics is considered as basic science its principles, laws, hypothesis, concepts, ideas are playing important role in reinforcing the knowledge of technology. Deep thought is given while selecting topics in physics. They are different for various branches of engineering. This will provide sound background for self-development in future to cope up with new innovations. Topics are relevant to particular program and students will be motivated to learn and can enjoy the course of Physics as if it is one of the subjects of their own stream.

COURSE OBJECTIVE:

The course content should be taught and implemented with the aim to develop different types of skills leading to the achievement of the following competencies.

1. Select proper measuring instrument on the basis of range, least count & precision required for measurement.
2. Analyze properties of material & their use for the selection of material mostly applicable for engineering users.
3. Identify, analyze, discriminate and interpret logical sequence of field problems with the study of physics.
4. Analyze variation of sound intensity with respect to distance.
5. Follow the principles used in the physical properties, its measurement and selections.

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				Total (Marks)
Lecture	Tutorial	Practical	Credit	Theory		Practical		
				University Assessment	Continuous Assessment	University Assessment	Continuous assessment	
3	-	2	4	60	40	20	30	150

DETAILS OF COURSE CONTENTS:

SR. NO.	TOPIC	Total Hours	Weightage
1	SI Units & Measurements: 1.1 Explain Physical Quantities and their units. 1.2 Measure given dimensions by using appropriate instruments accurately. 1.3 Calculate error in the measurement 1.4 Solve numerical based on above outcomes	06	14
2	Motion and Force: 2.1 Differentiate among various forces in nature 2.2 Define inertia, momentum and impulse of force 2.3 State Newton's laws of motion 2.4 State law of conservation of momentum 2.5 Solve numerical problems based on above topics	06	13
3	General properties of matter: 3.1 Comprehend the concept of elasticity and Define Stress, Strain and Elastic limit. 3.2 State Hooke's law. 3.3 Explain the term elastic fatigue. 3.4 Distinguish between Streamline and Turbulent flow 3.5 Define coefficient of viscosity. 3.6 Apply the principle of viscosity in solving problems. 3.7 State significance of Reynold's number 3.8 Explain terminal velocity. 3.9 Mention Stoke's formula. 3.10 Explain the effect of temperature on Viscosity 3.11 Comprehend the phenomenon of surface tension and its applications. 3.12 Define surface tension. 3.13 Explain angle of contact and capillarity. 3.14 Solve problems related to surface tension.	09	21
4	Waves and Sound: 4.1 Comprehend the concept of wave motion 4.2 Distinguish between transverse and longitudinal waves. 4.3 Define period, frequency, amplitude and wavelength 4.4 Explain principle of superposition of waves	05	15

	4.5 Define resonance 4.6 Explain resonance. 4.7 State Formula for velocity of sound in air		
5	Static & Current Electricity 5.1 State Coulomb's law, Ohm's law and Kirchhoff's law 5.2 Explain Electric field, potential And potential difference 5.3 Define intensity, electric current, resistance 5.4 Apply laws of series and Parallel combination to electrical circuits 5.5 Explain heating & chemical effect of current 5.6 Solve numerical based on above outcomes	09	20
6	Electromagnetism: 6.1 Define magnetic intensity and flux and state their units 6.2 Distinguish between dia, para and ferro magnetic materials 6.3 Explain electromagnetic induction and its use. 6.4 State lenz's law 6.5 State applications of AC	08	17

COURSE OUTCOME:

Understand basic physical concepts and vocabulary used to describe them: electricity and magnetism. Develop skills in observation, interpretation, reasoning, synthesis, generalizing, predicting, and questioning as a way to learn new knowledge. Develop scientific problem solving skills, including organization of given information, identification and application of pertinent principles, quantitative solutions, interpreting results, and evaluating the validity of results. Apply conceptual understanding of the physics to general real-world situations.

LIST OF PRACTICAL:

1. Linear Measurement by Vernier caliper
2. Linear Measurement by Micrometer screw
3. Measurement of Surface tension
4. Measurement of Viscosity
5. Measurement of Young's Modulus
6. To determine Force constant with the help of periodic time of oscillations of spring
7. Measurement of specific gravity
8. To calculate refractive index of material of prism using spectrometer device.

9. To measure acceleration due to gravity by simple pendulum.
10. To study the relation between the length of a stretched string and the tension in it with the help of a sonometer.
11. To calculate resistance using Ohm's law.
12. To verify law of resistance in series and parallel.
13. To find unknown resistance through whetstone bridge.

LIST OF REFERENCES:

1. Textbooks of CBSE Physics Part-1 & Part -2, Std.-11 & Std.-12
2. Fundamental of PHYSICS by Halliday, Resnik and Walker
3. Concept of physics by H.C.Verma
4. Conceptual Physics by Hewitt
5. Physics for Scientist and Engineers by Giancoli