

1004 - APPLIED PHYSICS I R1										
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
Lectures	Practical	Credits			Theory		Practical Ex.		Total	
3	2	5	25	25	3Hrs.	100			150	
Pre-requisite		Source			Theory	Test	Total	TW	PR	Gr Total
Nil		SMH	Semester		75	25	100	25	-	125

**RATIONALE:** The development of all engineering topics is based on fundamental principles. In order to study engineering application knowledge of basic principles of physics is essential. Hence physics forms a basic science subject to all engineers. Emphasis is required to be given on the application of basic principles to engineering situations.

**Note:** Applied Physics I should be taught in S.I. units.

COURSE CONTENTS		Hrs	Mks
<b>1. UNITS AND DIMENSIONS</b>		05	10
Fundamental and derived units. S.I. Units; Dimensions & dimensional formula. Principle of homogeneity; use of dimensional analysis in checking the corrections of an equation, definition of L.C., L.C. of Vernier Caliper and Micrometer Screw gauge. Errors in measurements: - Types of error, systematic-error, constant-error, random error, absolute-error, and percentage-error.			
<b>2. CIRCULAR MOTION AND GRAVITATION</b>		10	20
Definition of uniform circular motion, angular displacement, angular velocity, tangential velocity, radial acceleration, relation between linear and angular velocity, definition and concept of centripetal force and centrifugal force, expression for centripetal and centrifugal force (no derivation), expression for velocity of a vehicle moving on a curved horizontal road, super elevation of roads, expression for banking, application of centrifugal force in centrifuge machine, Newton's Law of gravitation, force of gravity, acceleration due to gravity, expression for acceleration due to gravity, variation of g with height, definition of Escape velocity, expression for Escape velocity, definition of Satellite, launching of satellite, critical velocity, expression for critical velocity.			
<b>3. GENERAL PHYSICS</b>		14	30
Definition of elasticity, stress-strain and elastic limit. Statement of Hook's law, modulus of elasticity definition of Young's modulus, rigidity modulus determination of Young's modulus by Searle's method. Behaviour of a wire under continuously increasing stress, concept and definition of surface tension in terms of capillary rise, applications of surface tension, definition and explanation of viscosity, statement of Newton's law of viscosity and coefficient of viscosity, terminal velocity (no derivation), Stoke's law, determination of viscosity of a liquid by Stoke's method, streamline and Turbulent flow, definition of critical velocity, Reynold's number.			
<b>4. HEAT</b>		14	30
Statement of (a) Boyle's law (b) Charles's law and (c) Gay Lussac's law, Concept of absolute zero Kelvin's scale of temperature, derivation of general gas equation Definition of specific heat units of specific heat, change of state of a material with change in temperature Definition and units of latent heat of fusion and latent heat of vaporisation, calculation of heat losses and heat gain, specific heat of gas, specific heat at constant pressure specific heat at constant volume; ratio of specific			

heats, definition of isothermal process and adiabatic process, modes of heat transfer, conduction, convection and radiation and examples, conduction of heat along a bar, variable and steady thermal state, law of thermal conductivity, definition and unit of coefficient of thermal conductivity, determination of thermal conductivity of a good conductor by Searle's method, determination of thermal conductivity of a bad conductor by Lee's disc method.

**5. OPTICS**

5 10

Refraction, laws of refractions, refraction of light through a glass slab, critical angle, total internal reflection, examples, photometry, definition and units of luminosity and intensity of illumination, inverse square law of illumination, principle of photometry.

**Total**

48 100

**PRACTICAL**

1. Measurement of using Vernier Calipers
2. Measurement using Screw Gauge
3. Determination of g using Simple Pendulum
4. Determination of Young's Modulus by Searle's method
5. Surface Tension by Capillary rise method
6. Coefficient of viscosity by Stoke's method
7. Verification of Boyle's law
8. Thermal conductivity of good conductor by Searle's method
9. Thermal conductivity of bad conductor by Lee's Disc method
10. Refractive Index of glass.

**REFERENCE BOOKS**

1. Applied Physics for Polytechnics by Bhandarkar
2. Applied Physics for Polytechnic by B.G. Dhande
3. Engineering Physics by R.K. Gaur and S.L. Gupta
4. ABC of Physics by Modern Publishers.

