

Subject Code:1SC1050301

Subject Title: Physics - 301

COURSE OBJECTIVE:

Physics is a science to understand the nature. This course is designed to get basic understanding of the physical world.

LEARNING OUTCOMES:

- Develop an actual understanding of the Heat and Thermodynamics and Kinetic theory of gases.
- To know the basic concept of Special theory of Relativity.
- Understand the Crystal Structure and its application in various fields.

Teaching scheme (hours) per week		credit		Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
3	--	3	--	70	30	--	--	100

A. Physics Theory:

Unit	Content	Lectures	Weight (%)
1	<p>Heat and Thermodynamics: Characteristic functions, Enthalpy , The Helmholtz and Gibb's function ,Two Mathematical Theorems, Maxwell's equations , The T-ds equations, Energy equation, The Thermal Expansivity, Compressibility, Joule-Kelvin effect (Porous plug Experiment), Liquefaction of Gases by Joule-Kelvin effect.</p> <p>Kinetic Theory of Gases: Maxwell's Distribution Law of Velocities, Deduction of Maxwell-Boltzmann law , Determination of the values of constants 'a' and 'b', Experimental Test of Maxwell's Law.</p>	15	33
2	<p>Diffraction: Distinction between Interference and diffraction, Fresnel and Fraunhofer types of diffraction, Fraunhofer diffraction at a double slit, Fraunhofer diffraction at double slit (Calculus method), Distinct between single slit and double slit diffraction pattern, Fraunhofer diffraction at N slit, Plane diffraction grating, Theory of plane transmission grating, Dispersive power of Grating</p> <p>Special theory of Relativity: Newtonian Relativity, Michelson-Morley experiment , Special theory of relativity, Lorentz Transformation , Consequences of Lorentz Transformation (a) Relativity of Simultaneity (b) the Lorentz-Fitz Gerald length Contraction (c) Time Dilation, Addition of Velocities, Mass-energy relation, Space time.</p>	15	34
3	<p>Crystal Structure: Crystalline and Amorphous Solids, Crystal Lattice and Crystal</p>	15	33

	<p>Structure, Translational Symmetry, Space, Unit Cell and Primitive Cell, Symmetry Elements in Crystals, The Seven crystal Systems, Coordination Number, Some importance crystal structure, Simple Cubic Structure, Body Centered Cubic Structure, Face Centered Cubic Structure, Wigner-Seitz Cells, Miller Indices, The spacing of a set of crystal planes.</p> <p>Atomic Spectra: Franck-Hertz experiment, Critical potentials Shortcomings of Bohr's Theory, Sommerfeld extension of Bohr theory</p>		
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Basic Reference book:

1. University Physics by Sears, Zeemansky and Young. (6th Edition) Narosa Publication, New Delhi.
2. Heat Thermodynamics and Statistical Physics by Brijlal, Dr. Subrahmanyam, P.S.Hemne -S.Chand &Co..
3. Waves and Oscillations by N Subramanyam, Brijlal.
4. A Text book of Light by D.N.Vasudeva - S. Chand &Co.
5. Fundamentals of Optics by Jonkin's and White
6. Optics by Ajoy Ghatak
7. Principles of Optics by B.K. Mathur
8. Introduction to Solid State Physics By C.Kittle (John Willey)
9. Elements of Solid State Physics by J.P.Srivastava (PHI)

Subject Code:1SC1050303

Subject Title: Physics Practical

COURSE OBJECTIVE:

Physics is a science to understand the nature. This course is designed to get basic understanding of the physical world.

LEARNING OUTCOMES:

- Develop actual ideas of the physics theory.
- To know the basic concept of physics theory.
- Understand the physics theory by practical.

Teaching scheme (hours) per week		credit		Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
--	6	--	3	--	--	60	40	100

Physics Practical:

1. Coaxial Viscometer
2. To determine wave length of bright lines of mercury light using grating.
3. R.P. of Telescope
4. Searl's Goniometer. Determination of cardinal points and 'do'
5. Kundt's tube. Determination of 'y'
6. Diffraction by Adser 'A' Pattern
7. e/k by Power Transistor
8. Absolute value of capacity using B.G. or S.G.
9. Low resistance by method of Projection
10. Comparison of capacity (C1/C2) by Desauty method
11. To determine self inductance by Anderson Bridge
12. Characteristics of a C.B. Transistor (PNP)
13. Characteristics of JFET & Determination of μ , r_d , g_m
14. Construction of AND, OR, NOT Gates using NAND & NOR Universal gates.