

Subject Code:2SC1050402

Subject Title: Physics -402

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 digital electronics.
- To know the basic concept of radioactivity and nuclear reaction.
- Understand the modern physics.

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	Digital Electronics: Introduction, Number systems used in Digital Electronics, Decimal, Binary, Hexadecimal and Octal , Binary Codes -(A) BCD, (B) Gray, (C) Excess-3 Codes, Arithmetic Circuits – Exclusive - OR Gate, Applications of X-OR Gate: (i) Binary to Gray Code Converter (ii) A Parity Checker (iii) The Half Adder (iv) The Full Adder (v) Parallel Adder (vi)Half subtractor, (vii)Full subtractor. A.C. Bridges: A.C. Bridges, Maxwell's Bridge, Schering Bridge	15	33
2	Detectors and Accelerators: Introduction, Interaction between Particles and Matter (A brief survey), Detectors or Nuclear Particles, (i) Proportional counter (iii) scintillation counter (iv) Solid State or Semiconductor detectors, Particle Accelerators, Need for an Accelerator of charged Particles : (ii) The Cyclotron, (iii) Synchrotron. Radioactivity: Review of Radioactive decay laws, half life, mean life time etc).Radioactive growth and decay, Ideal equilibrium Transient equilibrium and secular equilibrium Radioactive series Radioactive series, Determination of the age of the Earth , Carbon Dating-Archaeological Time Scale, Q- equation.	15	34
3	The Basic concepts of Plasma: Introduction, Composition and Characteristics of a Plasma, Collisions, Elastic collisions , Inelastic collisions, Surface Phenomena, Transport Phenomena, Diffusion and Mobility, Viscosity, Conductivity,	15	33

	Recombination, Ohm's law, Gas Discharge, Composition of various natural and Man-made Plasma , Plasma diagnostics, Plasma waves and Instabilities Confinement of Plasma, Space Plasma. Modern Physics: Orbital and Magnetic Dipole Moment, Electron spin, Pauli's Exclusion Principle. Normal Zeeman Effect, Explanation of Normal Zeeman Effect.		
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Basic Reference book:

1. Hand book of Electronics by Gupta & Kumar 30th Revised Edition, 2002 Pragati Prakashan, Meerut.
2. Electricity and Magnetism By K.K.Tewari (S.Chand & Company Ltd.)
3. Elements of Nuclear Physics by M.L.Pandya & R.P.S.Yadav Kedarnath Ramnath Meerut
4. Nuclear Physics by Kaplan
5. Spectroscopy Vol.-I by Walker & Straw
6. Atomic Physics by J.B.Rajam (5th Edition-1960) S. Chand & Co.
7. Physics of Atoms and Molecules by B.H.Bransden & C.J. Joachagh, Pearson Education.