Jananayak Chandrashekhar University Ballia

Faculty of Science

Department of Physics

SYLLABUS OF PHYSICS (ONLY FOR MINOR PAPER) FOR PG

(National Education Policy-2020)

(W.E.F. 2022-2023)

Department of Physics

Course Title: Physics (Only for Minor Paper) **Type of course: Minor**
Credits: 04 (Theory: 60 Hours) **Max. Marks: 100**

Unit	
1.	**Relativity and Quantum mechanics:** Inertial & non-inertial frames, Einstein's postulates of special theory of relativity, Variation of mass with velocity. Relation between Energy & Mass (Einstein's mass & energy relation) and Energy & Momentum. Photoelectric Effect and Planck's Quantum, introduction of quantum mechanics.
2.	**Solid State Physics:** Crystalline and amorphous solids. The crystal lattice. Basis vectors. Unit cell. Symmetry operations. Point groups and space groups, Three dimensional crystal systems. Miller indices, Simple crystal structures: NaCl and Diamond, X-ray diffraction by crystals. Laue theory
3.	**Nuclear and Atomic Physics:** Introduction to the Atoms and Nucleus, Bohr atomic modal, general Properties of the Nucleus, Mass defect and binding energy, Nuclear Models – Liquid Drop Model, Introduction of Elementary Particles.
4.	**Electronics:** Semiconductors, P.N. Junction Diode, Zener Diode, Tunnel diodes, LED, Bipolar transistors and their characteristics, Field effect transistors (JFET &MOSFET) and their characteristics, Logic Gates- OR, AND, NOT, NAND, NOR, EX-OR.

Suggested Readings:

1- R. Murugeshan, KiruthigaSivaprasath, "Modern Physics", S. Chand Publishing, 2019, 18e
2- Principal of electronics: V.K. Mehata, S.Chand Publication.
3- Basic Electronics and Linear Circuit By N. N. Bhargava and D. C. Kulshreshtha, Mc Graw Hill, 2e.
4- A. Beiser, Shobhit Mahajan, "Concepts of Modern Physics: Special Indian Edition", McGraw Hill, 2009, 6e
5- D.C. Tayal, "Electricity and Magnetism", Himalaya Publishing House Pvt. Ltd., 2019, 4e
6- D.J. Griffiths, "Introduction to Electrodynamics", Prentice-Hall of India Private Limited, 2002, 3e
7- S.N. Ghoshal, "Nuclear Physics", S. Chand Publishing, 2019

Suggestive Digital Platforms / Web Links

1. MIT Open Learning - Massachusetts Institute of Technology, https://openlearning.mit.edu/
2. National Programme on Technology Enhanced Learning (NPTEL), https://www.youtube.com/user/nptelhrd
3. Uttar Pradesh Higher Education Digital Library, http://heecontent.upsdc.gov.in/SearchContent.aspx
4. SwayamPrabha - DTH Channel, https://www.swayamprabha.gov.in/index.php/program/current_he/8

Prof. A.N. Singh