

Teaching Plan
(Session 2021-22)

Class- B.Sc. 3

Teacher Name-Sunita Saini

Subject-Physics

Period No. 4 Name of Paper -Nuclear and Radiations Physics, Electronics

Sr. No.	Date	Topics to be covered
1.	01/09/2021-20/09/2021	Constituents of nucleus and their intrinsic properties, Qualitative facts about size, mass, density, energy, charge. Binding energy, angular momentum, magnetic moment and electric quadruple moments of the nucleus, Wave mechanical properties of nucleus, average binding energy and its variation with mass numbers, Properties of nuclear forces,
2.	21/09/2021-10/10/2021	Non existence of electrons in the nucleus and neutron-proton model, Liquid drop model and semi empirical mass formula, Conditions of nuclear stability, Fermi gas model. Nuclear shell model. Experimental evidence of magic numbers and its explanation. Radioactivity. Modes of decay and successive radioactivity. Alpha emission. Electron emission, Positron emission.
3.	11/10/2021-30/10/2021	Electron capture, Gamma-ray emission, Internal conversion, Qualitative discussion of alpha, beta and gamma spectra, Geiger-Nuttal rule, Neutrino hypothesis of beta decay. Evidence of existence of neutrino, Qualitative discussion of alpha and beta decay theories, Nuclear reactions. Reaction cross section, Conservation laws. Kinematics of nuclear reaction,
4.	01/11/2021-20/11/2021	Q-value and its physical significance, Compound nucleus, Possible reaction with high energy particles. Concept of current and voltage sources, p-n junction, Biasing of diode, V-A characteristics. Diode equation, Breakdown diodes: Zener breakdown and avalanche breakdown MST WILL BE HELD
5.	21/11/2021-5/12/2021	Zener diode. Rectification: half wave, full wave rectifiers and bridge rectifiers, Qualitative analysis of Filter circuits (RC LC and π filters) Efficiency, Ripple factor, Voltage regulation. Voltage multiplier circuits.
7.	28/01/2022-15/02/2022	Energy loss due to ionization (Bethe's formula), Energy loss of electrons, Bremsstrahlung, Interactions of gamma rays with matter. Radiation loss by fast electrons, Radiation length, Electron-positron annihilation, Cyclotron. Betatron, Qualitative discussion of Synchrotron, Collider machines and linear accelerator.
8.	16/02/2022-01/03/2022	Ionization chamber, Proportional counter, GM counter, Scintillation counter, Solid state detectors, Elementary particles and their masses, Decay modes, Classification of these particles, types of interactions. Conservation laws and quantum numbers, Concepts of isospin.

9.	02/03/2022-15/03/2022	Strangeness, Parity, Charge conjugation. Antiparticles, Gell-Mann method, Decay and strange particles. Particle symmetry, Introduction to quarks and qualitative discussion of the quark model. MST WILL BE HELD
10.	16/03/2022-01/04/2022	Gunn effect and diodes: Mechanism, Characteristic, Negative differential resistivity and Domain formation Tunnel diode: Tunneling Phenomenon, Operation, Applications. Merits and Drawbacks Transistor biasing: Stabilization of operating point, Fixed bias, Collector to base bias, Bias circuit with emitter resistor, Voltage divider biasing circuit.
11.	02/04/2022-25/04/2022	CE amplifier: Working and analysis using h-parameters, Equivalent circuits, Determination of current gain, Power gain, Input impedance, FET amplifier: Voltage, Current and Power gain Feed back in amplifiers: Types & advantage of negative feedback. Emitter follower as negative feed back circuit.

Principal

Signature of teacher