

## Teaching Plan (Session 2022-23)

Class- B.Sc. 3 (SEM V&VI) 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.	01/09/2022-5/09/2022	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.  Group discussion
2.	7/09/2022-12/09/2022	Wave mechanical properties of nucleus, average binding energy and its variation with mass numbers, Properties of nuclear forces.  Class test
3.	14/9/2022-19/9/2022	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.
4.	21/09/2022-26/09/2022	Experimental evidence of magic numbers and its explanation. Radioactivity. Modes of decay and successive radioactivity. Alpha emission.  Topic presentation by students
5.	28/09/22-03/10/22	Electron emission, Positron emission. Electron capture, Gamma-ray emission, Internal conversion, Qualitative discussion of alpha, beta and gamma spectra, Geiger-Nuttal rule.  Class test for internal assessment
6.	05/10/2022-10/10/2022	Neutrino hypothesis of beta decay. Evidence of existence of neutrino, Qualitative discussion of alpha and beta decay theories.  MST WILL BE HELD
7.	12/10/2022-17/10/2022	Nuclear reactions. Reaction cross section, Conservation laws Kinematics of nuclear reaction, Q-value and its physical significance.  Class test
8.	26/10/22-31/10/22	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.  Group discussion
9.	26/10/22-31/10/22	Breakdown diodes: Zener breakdown and avalanche breakdown Zener diode, Rectification: half wave, full wave rectifiers and bridge rectifiers.
10.	2/11/22-7/11/22	Qualitative analysis of Filter circuits (RC LC and $\pi$ filters) Efficiency, Ripple factor, Voltage regulation. Voltage multiplier circuits.  Class test
11.	8/11/22-14/11/22	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.
12.	16/11/22-21/11/22	Cyclotron, Betatron, Qualitative discussion of Synchrotron, Collider machines and linear accelerator.
13.	23/11/22-03/12/22	Revision and MST
14.	6/2/2023-11/2/2023	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. Class test
15.	13/2/23-18/2/23	Strangeness, Parity, Charge conjugation. Antiparticles, Gell-Man method, Decay and strange particles. Particle symmetry, Introduction to quarks and qualitative discussion of the quark model. Discussion
16.	20/2/23-25/2/23	Gunn effect and diodes: Mechanism, Characteristic, Negative differential resistivity and Domain formation. Assignment given to students
17.	27/2/23-4/3/23	Tunnel diode: Tunneling Phenomenon, Operation, Applications. Merits and Drawbacks
18.	6/3/23-11/3/23	Transistor biasing: Stabilization of operating point, Fixed bias, Collector to base bias, Bias circuit with emitter resistor, Voltage divider biasing circuit.
19.	13/3/23-18/3/23	CE amplifier: Working and analysis using h-parameters, Equivalent circuits, Determination of current gain, Power gain, Input impedance. Ppt presentation
20.	20/3/23-25/3/23	FET amplifier: Voltage, Current and Power gain
	27/3/23-1/4/23	Class test
21.	3/4/23-8/4/23	Feed back in amplifiers: Types & advantage of negative feedback. Emitter follower as negative feed back circuit.
22.	10/4/23-15/4/23	Mst exams
23.	17/4/23-22/4/23	Revision
24.	24/4/23-29/4/23	Revision

Principal

Signature of teacher