

CURRICULUM PLAN 2020-21 (Odd Semesters: I,III,V)
B. Sc. (PHYSICAL SCIENCE)
Semester – V

Dr.Aravind Kumar

Name of Paper & Code	Allocation of Lectures	Month wise schedule followed by the Department
ELEMENT OF MODERN PHYSICS		
1. Planck's quantum, Planck's constant and light as a collection of photons; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment.	10	20-Aug-2021 to 15-Aug-2021
1 Problems with Rutherford model- instability of atoms and observation of discrete atomic spectra; Bohr's quantization rule and atomic stability; calculation of energy levels for hydrogen like atoms and their spectra.	4	15- Aug-2021 to 31-Aug-2021
Position measurement- gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle- impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle. 1.Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of wave function, probabilities and normalization; Probability and probability current densities in one dimension.	15	01 Sep-2021 to 30 Sep-2021
1. One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as an example; Quantum mechanical scattering and tunneling in one dimension - across a step potential and across a rectangular potential Barrier.	13	01-oct-2021 to 20-Oct-2021
Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, semi-empirical mass formula and binding energy.	8	20-Oct-2021 to 05-Nov-2021
1.Radioactivity: stability of nucleus; Law of radioactive decay; Mean life & half-life; α -decay; β -decay-energy released, spectrum and Pauli's prediction of neutrino; γ -ray Emission.	11	06-Nov-2021 to Till End The Sem