Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
BSC-202	Engineering Physics	BSC	5	4	1	0	50	100	150

Course Outcomes

At the end of the course the student will be able to	
CO1	Apply the concept of gradient, divergence, and curl to understand advance physics.
CO2	Use Maxwell's equations to describe propagation of electromagnetic waves in a medium.
CO3	Apply the concept of wave function to solve problems related to particle confined in a box.
CO4	Understand the concept of interference, diffraction, and polarization of light.
CO5	Understand and articulate the working principle of lasers and optical fibres

Detailed Syllabus

Section A

Unit 1: Mathematical Physics: Concepts of Del Operator; Gradient of scalar, divergence and Curl of vector, Gauss divergence theorem and Stokes theorem **(10 Hrs)**

Unit 2: Electromagnetic Theory: Displacement Current, Maxwell's equations in vacuum and non-conducting medium, Electromagnetic wave propagation in free space (EM wave equations for electric and magnetic fields for free space) and their solutions (plane wave solution), Velocity of electromagnetic waves. **(10 Hrs)**

Unit 3: Quantum Mechanics: Inadequacies of Classical Mechanics, de-Broglie's concept of matter waves, Wave-packet (Wave-group), Phase and Group velocity, Heisenberg's uncertainty Principle, Experimental illustration of Uncertainty principle using single slit. Wave function: Definition, Interpretation and its significance, Schrodinger's Wave equation (Steady state and time dependent) for one dimension case, Concept of Operators and expectation Values, Applications of Schrodinger's equation (Time Independent) to: a) Particle in a One-Dimensional Box of infinite height, b) Single Step Potential Barrier. **(16 Hrs)**

Section B

Unit 4: Applied Optics: Interference in thin films (by reflection and transmission of light), Theory of Newton's rings by reflected light, Determination of wavelength and refractive index of monochromatic light by Newton's rings theory, Fraunhofer and Fresnel's diffractions, Fraunhofer diffraction due to a single slit, Plane diffraction grating and its theory for secondary maxima and minima, Unpolarised and polarized light, Double refraction phenomenon, Nicol Prism, Mathematical representation of elliptically and circularly polarized light, Quarter and Half wave plates, Numerical problems. **(15 Hrs)**

Unit 5: Principal of Laser action, Einstein's coefficients, Ruby Lasers, Propagation of Light in Optical fibres, Acceptance angle and acceptance cone, Numerical Aperture, Single mode and Multimode fibres, Characteristics and General applications of Lasers and Optical fibres, Numerical problems. **(5 Hrs)**

Text Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Vector Analysis	Murray R. Spiegel	McGraw Hill Education	2nd (2017)
2	Fundamentals of Physics	Robert Resnick Jearl Walker, David Halliday	Wiley	10th (2015)
3	Concepts of Modern Physics	Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury	McGraw Hill Education	7th (2017)

Reference Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Engineering Physics	H. K. Malik and A. K. Singh	McGraw Hill Education	2nd (2017)