

| <b>B.Tech Biotechnology: Semester-I</b> |                               |
|---|-------------------------------|
| <b>BAS-101- Physics</b>                 |                               |
| <b>Teaching Scheme</b>                  | <b>Examination Scheme</b>     |
| Lectures: 3 hrs/Week                    | Class Test -12 Marks          |
| Tutorials: 1 hr/Week                    | Teachers Assessment – 6 Marks |
| Credits: 4                              | Attendance – 12 Marks         |
|   | End Semester Exam – 70 marks  |

**Course Objective:**

Understand physical sciences basics and applied knowledge

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1: To develop insights of fundamental physics
- CO2: To develop applied understanding of physics for lifesciences
- CO3: Better understanding of fundamentals of core physics in instrumental applications

**UNIT- I Relativistic Mechanics and Interference**

Frame of reference, Galilean transformation, Inertial and Non-inertial frames, Postulates of special theory of relativity, Michelson-Morley experiment, Lorentz transformation of space and time, Length contraction, Time dilation, Addition of velocities, Variation of mass with velocity, Equivalence of mass and energy, Momentum-energy transformation equations

**Interference**

Theory of interference of light, Conditions for sustained interference, Classification of interference, Fresnel's Biprism experiment, displacement of fringes, Interference in thin films- wedge shaped film and Newton's rings.

**UNIT- II Diffraction and Polarization**

**Diffraction**

Single, Double & N- slit Diffraction, Diffraction grating, Grating spectra, Rayleigh's criterion and resolving power of grating

**Polarization**

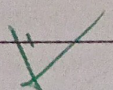
Phenomena of double refraction, Doubly refracting crystals, Quarter wave plate & Halfwave plate, Nicol prism, Production and analysis of plane, circular and elliptical polarized light, Optically active substance, Fresnel's theory of optical activity, Specific rotation and Polarimeters.

  
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**UNIT -III Laser, Holography and Fiber Optics**

**Laser and Holography**

Spontaneous and stimulated emission of radiation, Einstein's coefficients, construction and working of Ruby, He-Ne lasers and laser applications,

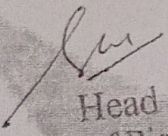
Basic Principle of Holography, Construction and reconstruction of Image on hologram and applications of holography

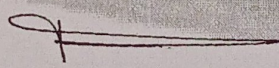
**Fiber Optics**

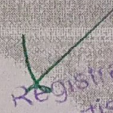
Fundamental ideas about optical fiber, Types of fibers, Acceptance angle and cone, Numerical aperture, Propagation mechanism and communication in optical fiber, Attenuation, Signal loss in optical fiber and dispersion.

**Suggested Readings**

- Aurthur Beiser, "Concepts of Modern Physics" - (Mc-Graw Hill)
- Robert Resnick – "Introduction to Special theory of Relativity" - Wiely
- AjoyGhatak , "Optics - (TMH)" Brijlal& Subramanian (S. Chand )
- Anuradha De., " Optical Fibre & Laser" - ( New Age )
- Resnick, Halliday& Walker, " Fundamental of Physics" - (Wiely )
- R.A. Serway& J.W. Jewett, "Principles of Physics" - (Thomson Asia Pvt. Ltd.)

  
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