



S.K.R. & S.K.R. Govt. College for Women (Autonomous), Kadapa.

Reaccredited with 'B' Grade by NAAC

Y.S.R.Kadapa District – 516001, Andhra Pradesh

DEPARTMENT OF PHYSICS

B.Sc. 1st year 2nd Semester Physics Syllabus

PAPER-II: Wave Optics

Work load: 60 hrs per semester

4 hrs/week

UNIT I

Interference of light:

(12hrs)

Introduction, Conditions for interference of light, Interference of light by division of wave front and amplitude, Phase change on reflection Stokes' treatment, Lloyd's single mirror, Interference in thin films: Plane parallel and wedge shaped films, colours in thin films, Newton's rings in reflected light-Theory and experiment, Determination of wavelength of monochromatic light.

UNIT-II

Diffraction of light:

(12hrs)

Introduction, Types of diffraction: Fresnel and Fraunhofer diffractions, Distinction between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction at a single slit, Plane diffraction grating, Determination of wavelength of light using diffraction grating, Fresnel's half period zones, Zone plate, comparison of zone plate with convex lens.

UNIT-III

Polarisation of light:

(12hrs)

Polarized light: Methods of production of plane polarized light, Double refraction, Brewster's law, Malus law, Nicol prism, Nicol prism as polarizer and analyzer, Quarter wave plate, Half wave plate, Plane, Circularly and Elliptically polarized light-Production and detection, Optical activity, Laurent's half shade polarimeter: determination of specific rotation.

UNIT-IV

Aberrations and Fibre Optics:

(12hrs)

Monochromatic aberrations, Spherical aberration, Methods of minimizing spherical aberration,

Coma, Astigmatism and Curvature of field, Distortion; Chromatic aberration-the achromatic doublet; Achromatism for two lenses (i) in contact and (ii) separated by a distance.

Fibre optics: Introduction to Fibers, different types of fibers, rays and modes in an optical fiber, Advantages of fiber optic communication.

UNIT-V

Lasers and Holography:

(12hrs)

Lasers: Introduction, Spontaneous emission, stimulated emission, Population Inversion, Laser principle, Einstein coefficients, Types of lasers-He-Ne laser, Ruby laser, Applications of lasers; Holography: Basic principle of holography, Applications of holography

Reference Books:

1. BSc Physics, Vol.2, Telugu Academy, Hyderabad
2. A Text Book of Optics-N Subramanyam, L Brijlal, S.Chand & Co.
3. Optics- Murugesan, S.Chand & Co. • Unified Physics Vol.II Optics, Jai Prakash Nath & Co. Ltd., Meerut
4. Optics, F.A. Jenkins and H.G. White, McGraw-Hill

5. Optics, AjoyGhatak,TataMcGraw-Hill.
6. Introduction of Lasers – Avadhanulu, S.Chand& Co.
7. Principles of Optics- BK Mathur, Gopala Printing Press, 1995

B.Sc II Sem. – Physics

Practical Paper 2: Wave Optics

Work load:30 hrs per semester

2 hrs/week

1. Determination of radius of curvature of a given convex lens-Newton's rings.
2. Study of optical rotation –polarimeter.
4. Dispersive power of a prism.
5. Determination of wavelength of light using diffraction grating-minimum deviation method.
6. Determination of wavelength of light using diffraction grating-normal incidence method.
7. Resolving power of a telescope.
8. Refractive index of a liquid-hallow prism
9. Determination of refractive index of liquid-Boy's method.
10. Determination of Numerical aperture using Optical Fibre.
11. Determination of Wavelength of He-Ne Laser Light using Grating
12. Study of Bending Losses in Optical Fibre.

(Note: Minimum of 6 experiments to be done and recorded)