ix. Solved Problems in classical Mechanics, O.L. Delange and J. Pierrus, 2010, Oxford Press.
x. Classical Mechanics and properties of Matter, A. B. Gupta, Books and Allied publisher.
xi. Introduction to Electrodynamics, D.J. Griffiths, 3rd Ed., 1998, Benjamin Cummings.
xii. Elements of Electromagnetics, M.N.O. Sadiku, 2001, Oxford University Press.
xiii. Introduction to Electromagnetic Theory, T.L. Chow, 2006, Jones & Bartlett Learning.
xiv. Electromagnetic field Theory, R.S. Kshetrimayun, 2012, Cengage Learning.

PHYDSC303P

LAB: RAY OPTICS AND PHYSICAL OPTICS

Contact Hours: 60

Full Marks = 100

Course objective: *In this course, the students will learn to use various instruments, estimate various physical parameters for every experiment performed and report the result of experiments related to Ray optics and Physical optics.*

Two Experiments are to be performed – one from each part

Part-A: Ray Optics

1. To determine the focal length of a given convex lens by pin method.
2. To determine the focal length of a given convex lens by displacement method.
3. To determine the focal length of convex mirror with the help of convex lens by optical bench.
4. To determine the refractive index of the given liquid with the help of plane mirror, convex lens and spherometer.
5. To determine the refractive index of a given liquid by travelling microscope.
6. To determine refractive index of the material of a prism using sodium light source.
7. To determine the angle of minimum deviation of the angle of the given prism with the help of spectrometer & hence to find the refractive index of the material of the prism.
8. To draw the calibration curve connecting refractive index & wavelength of some known lines using prism & spectrometer & hence to calculate the wavelength of an unknown line.
9. To draw the calibration curve connecting the deviation of a ray by a prism & wavelength of some known lines using spectrometer & hence to calculate the wavelength of unknown line.

Part-B: Physical Optics

1. To determine the dispersive power & Cauchy constants of the material of a prism using mercury source.
2. To determine wavelength of sodium light using Fresnel Bi-prism.
3. To determine wavelength of sodium light using Newton's Rings.
4. To determine wavelength of (i) Na source & (ii) spectral lines of Hg source using plane diffraction grating.
5. To determine dispersive power & resolving power of a plane diffraction grating.
6. To determine the width of a single slit by the spectrometer with diffraction method.
7. To determine the grating constant of plane diffraction grating & hence to find the wavelength of an unknown line.
8. To determine the wavelength of a laser source using diffraction of a single slit.
9. To determine specific rotation of sugar solution using polarimeter.

Expected learning outcomes: *For demonstrating comprehensive knowledge and understanding, at the end of the above course the students will have the hands-on experience of using various optical instruments like optical bench, spectrometer, travelling microscopes and polarimeter.*

Reference books:

i. Waves: Berkeley Physics Course, vol. 3, Francis Crawford, 2007, Tata McGraw-Hill.

ii. Fundamentals of Optics, F.A. Jenkins and H.E. White, 1981, McGraw-Hill.

iii. Principles of Optics, Max Born and Emil Wolf, 7th Edn., 1999, Pergamon Press.

iv. Optics, Ajoy Ghatak, 2008, Tata McGraw Hill.

v. The Physics of Vibrations and Waves, H. J. Pain, 2013, John Wiley and Sons.

vi. The Physics of Waves and Oscillations, N.K. Bajaj, 1998, Tata McGraw Hill.

vii. Fundamental of Optics, A. Kumar, H.R. Gulati and D.R. Khanna, 2011, R. Chand Publications.

viii. A text book on Light – B. Ghosh and K. G. Mazumdar (Shreedhar Publishers).

ix. Advanced Practical Physics Vol II – B. Ghosh (Shreedhar Publishers).