

Syllabus

B.Sc. (Physics)

(Sem.- II)

Name of the Course: F.Y.B.Sc. SEM-II- Paper – I: Optics

Sr.No.	Heading	Particulars
1	Description the course : Including but Not limited to:	Introduction, relevance, Usefulness, Application, interest, connection with other courses, demand in the industry, job prospects etc
2	Vertical :	Major/Minor/Open Elective /Skill Enhancement / Ability Enhancement/Indian Knowledge System
3	Type :	Theory / Practical
4	Credits :	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	Hours Allotted :	30 Hours
6	Marks Allotted:	50 Marks
7	Course Objectives (CO): After successful completion of this course students will be able to: CO 1. Explain the nomenclature used in lenses, lens equations for single convex lenses, and sign convention. lens maker's equation, Newton's lens equation and principal foci positions. CO 2. Describe Lateral, Longitudinal and Angular magnification, Equivalent focal length and power of two thin lenses, Concept of cardinal points and their significance CO 3. Explain qualitatively Spherical aberration & reduction, chromatic aberration & reduction. CO 4. Study of Fresnel and Fraunhofer type of diffraction and Fraunhofer diffraction pattern due to a single slit and double slit, CO 5. Learn Michelson's Interferometer and its Applications CO 6. Describe Polarization and types of Polarization CO 7. The students learn to apply their knowledge to solve problems that are covered in the all syllabus.	
8	Course Outcomes (OC): After successful completion of this course students will be able to: OC 1. Understand the nomenclature used in lenses, lens equations for single convex lenses, and sign convention. lens maker's equation, Newton's lens equation and principal foci positions. OC 2. To Understand Lateral, Longitudinal and Angular magnification, Equivalent focal length and power of two thin lenses, Concept of cardinal points and their significance OC 3. To comprehend qualitatively Spherical aberration & reduction, chromatic aberration & reduction. OC 4. To understand Fresnel and Fraunhofer type of diffraction and Fraunhofer diffraction pattern due to a single slit and double slit, OC 5. To understand Michelson's Interferometer and its Applications	

	OC 6.To understand Polarization and types of Polarization OC 7.Students should be able to solve problems related to the topics that are covered in the syllabus.
9	Paper – I: Optics (30 Hrs) UNIT-I (15 Hrs) 1. Lenses and Lens Maker’s Equation: Introduction to lenses, Terminology and sign conventions, Introduction to Thin lenses and Lens equation for single convex lens, Lens maker’s equation: Positions of the Principal Foci and Newton’s Lens equation. (SBA: 4.1, 4.2, 4.3, 4.7, 4.8, 4.9, 4.10, 4.10.1, 4.11) 2. Magnification by a lens and power of lens: Lateral, Longitudinal and Angular magnification, Deviation by a thin lens and its power, Equivalent focal length of two thin lenses, Focal length of the equivalent lens & power of two thin lenses, Concept of cardinal points and their significance (SBA: 4.12, 4.12.1, 4.12.2, 4.12.3, 4.15, 4.16, 4.17, 4.17.1, 4.17.2, 4.17.3, 4.17.4, 5.2) 3. Introduction to Aberration in lenses: Spherical aberration & reduction, chromatic aberration & reduction (Qualitative). SBA: 9.2, 9.5, 9.5.1, 9.10 Suitable numerical with appropriate difficulty level. UNIT-II (15 Hrs) 1. Fresnel diffraction: Introduction, Huygens-Fresnel’s theory, Fresnel’s assumptions, Distinction between interference and diffraction, Fresnel and Fraunhofer types of diffraction, (SBA: 17.1, 17.2, 17.3, 17.6, 17.7) 2. Fraunhofer diffraction: Introduction, Fraunhofer diffraction at a single slit, intensity distribution in diffraction pattern due to a single slit, Fraunhofer diffraction at double slit (Qualitative), Distinction between single slit and double slit diffraction patterns. (SBA: 18.1, 18.2, 18.2.1, 18.4, 18.4.2) 3. Michelson’s Interferometer: Principle, construction, working, Applications of Michelson Interferometer: a) Measurement of wavelength b) Determination of the difference in the wavelength of two waves c) Determination of the refractive index of gases. (SBA: 15.7, 15.7.1 to 15.7.3, 15.8, 15.8.1, 15.8.2, 15.8.4) 4. Polarization: Introduction, Polarization, Types of Polarization (SBA: 20.1, 20.2, 20.5,20.5.1, 20.5.2, 20.5.3)
10	Text Books
11	Reference Books Dr. N. Subrahmanyam, Brijlal, and Dr. M. N. Avadhanulu, A Textbook of Optics, 25th Revised Edition (2012) S. Chand.

Internal Continuous Assessment: 40% (20 Marks)	Semester End Examination: 60% (30 Marks)
Continuous Evaluation through: Quizzes, Class Tests, presentation, project, role play, creative writing, assignment etc.(at least 3)	
Format of Question Paper: 30 Marks Duration: ONE Hour	
Unit -I (15Marks)	Q:1 A) Attempt any Two 10Marks v) Theory vi) Theory vii) Theory viii) Theory B) Attempt any One 05 Marks iii) Problem iv) Problrm
Unit -II (15Marks)	Q:2 A) Attempt any Two 10Marks v) Theory vi) Theory vii) Theory viii) Theory B) Attempt any One 05 Marks ii) Problem ii) Problrm