**TEACHING SCHEDULE (OPTICS COURSE)**

Class Room: C202 Timings: 12pm-1pm Day: Thursday, Friday and Saturday

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| Lecture No | Topic | Content | Reference |
| 1 |  | Introduction to Course, Discussion on CAs and schedule of CAs |  |
| 2 | Geometrical Optics: | Refractive index, Optical path, Fermat’s Principle of least time, Derivation of the laws of reflection and refraction using Fermat’s Principle of least time | Singh,Ch#1 |
| 3 |  | Introduction to Lenses, Optical properties of lenses, Thin lenses & Thick lenses, Cardinal points of an optical system | Subhramanyam,  Ch#4,5 &6 |
| 4 |  | Co-axial system of two thin converging lenses-I | Subhramanyam,Ch#4&5 |
| 5 |  | Co-axial system of two thin converging lenses-II | Subhramanyam,Ch#4&5 |
| 6 | Lens Aberrations: | Aberrations: Spherical & Chromatic aberrations in lenses, Methods of minimizing Spherical Aberrations | Subhramanyam,Ch#9 |
| 7 |  | Method of minimizing Chromatic Aberration for (i) two lenses in contact & (ii) a coaxial lens system, Introduction to eyepieces | Subhramanyam,Ch#9 |
| 8 | Optical Instruments: | Ramsden’s eyepiece & Huygen’s eyepiece  ( construction and the cardinal points) | Singh, Ch#2 |
| 9 | Date: 14/07/2018 CA-I: MCQ-I & Discussion(Syllabus: Geometrical optics) | | |
| 10 |  | Telescopes, Refracting and Reflecting type of telescopes and Constant deviation Spectrometer. | Subhramanyam,Ch#10 |
| 11 | Interference: | Interference, Coherence, Conditions for Interference, Techniques of obtaining Interference | Subhramanyam,Ch#14 &  Singh,Ch#6 |
| 12 |  | Young’s Double Slit Experiment, Phase Change on reflection: Stoke’s law. | Subhramanyam,Ch#14 &  Singh,Ch#6 |
| 13 | Interference in Thin Films: | Thin Film, Plane Parallel Film, Interference due to Transmitted light, | Subhramanyam,Ch#15 |
| 14 |  | Haidinger Fringes, Wedge-shaped Film, | Subhramanyam,Ch#15 |
| 15 |  | Newton’s Rings. | Subhramanyam,Ch#15 |
| 16 | Interferometry: | Michelson’s Interferometer: Principle, Construction, Working | Subhramanyam,Ch#15 |
| 17 |  | Circular Fringes, Localised Fringes, White Light Fringes | Subhramanyam,Ch#15 |
| 18 |  | Application of Michelson’s Interferometer: Measurement of Wavelength and Determination of the difference in the wavelength of two waves | Subhramanyam,Ch#15 |
| 19 | Date: 09/08/2018 CA-I: MCQ-II & Discussion (Syllabus: Interference) | | |
| 20 | Diffraction: | Difference between Interference and Diffraction, Types of diffraction: Fresenel Class and Fraunhoffer Class | Subhramanyam,Ch#17 & Singh,Ch#7 |
| 21 | Fresnel Class: | Division of cylindrical wave-front into Fresnel’s half period strips | Singh,Ch#7 |
| 22 |  | Diffraction at straight edge | Singh,Ch#7 |
| 23 |  | Diffraction at a narrow wire | Singh,Ch#7 |
| 24 | Date: 18/08/2018 CA-III: Written Test (Syllabus: Geometrical optics & Interference) | | |
| 25 | Fraunhoffer Class: | Diffraction at a single slit | Subhramanyam,Ch#18 |
| 26 |  | Diffraction at double slit | Subhramanyam,Ch#18 |
| 27 |  | Contd. |  |
| 28 |  | Diffraction at N slits(only conceptual), Determination of wavelength of a spectral line using Plane Transmission Grating. | Subhramanyam,Ch#18 |
| 29 |  | Discussion: Written Test |  |
| 30 | Resolving Power: | Rayleigh’s criterion, Resolving power of telescope | Subhramanyam,Ch#19 |
| 31 |  | Resolving Power of Prism | Subhramanyam,Ch#19 |
| 32 | Date: 06/09/2018 CA-I: MCQ-III & Discussion (Syllabus: Diffraction) | | |
| 33 | Polarization: | Polarized Light, Natural Light, Production of Linearly Polarised Light, Anisotropic Crystal, Calcite Crystal | Subhramanyam,Ch#20 |
| 34 |  | Huygens Theory of Double Refraction in Uniaxial crystal | Subhramanyam,Ch#20 |
| 35 |  | Nicol prism- its fabrication, working and use, Effect of Polarizer on Natural Light, Effect of Analyser on Plane Polarized Light, | Subhramanyam,Ch#20 |
| 36 |  | Types of Polarized Light, Retardation plates - Quarter wave plate and Half wave plate, | Subhramanyam,Ch#20 |
| 37 |  | Production of Elliptically and Circularly Polarized Lights | Subhramanyam,Ch#20 |
| 38 |  | Cont. | Subhramanyam,Ch#20 |
| 39 |  | Detection of plane, circularly, elliptically polarized lights, Analysis of polarized light | Subhramanyam,Ch#20 |
| 40 | Polarimeter: | Optical activity, Specific rotation, Simple Polarimeter | Subhramanyam,Ch#20 |
| 41 |  | Laurent’s Half-Shade Polarimeter | Subhramanyam,Ch#20 |
| 42 |  | Revision |  |
| 43 |  | Revision |  |
| 44 |  | Revision |  |
| 45 |  | General Instruction about SEE |  |

**References:**

1. Subhramanyam N., Lal Brij, Avadhanulu M. N., A Text book of Optics, S. Chand & Company Ltd., New Delhi, First multicolour Edition (2006).
2. Singh S. P. and Agarwal J. P., Optics, Pragati Prakashan, 8th Edition (2001).

**Additional References**:

1. Mathur B. K., Principles of Optics, New Global Printing Press, Kanpur.
2. Ghatak Ajoy, Optics, Tata McGraw-Hill Publishing Company Ltd. (1977)