Syllabus

PANJAB UNIVERSITY, CHANDIGARH

B.Sc. Sem. III

Paper – B : OPTICS AND LASERS-I **(30 hrs.)**

UNIT - I

Interference : Concept of coherence, spatial and temporal coherence, coherence time, coherence length, area of coherence. Conditions for observing interference fringes. Interference by wave front division and amplitude division. Young's double slit experiment. , Michelson interferometer - working, principle and nature of fringes. Interference in thin films, Role of interference in anti- reflection and high reflection dielectric coatings. Multiple beam interference , Fabry - Perot interferometer, nature of fringes, finesse.

UNIT - II

Diffraction : Huygen - Fresnel theory half period zones, zones plates. Distinction between Fresnel and Fraunhofer diffraction. Fraunhofer diffraction at rectangular and circular apertures. Effects of diffraction in optical imaging, resolving power of microscope, telescope, Fabry - Perot interferometer. The diffraction grating, its use as a spectroscopic element, resolving power, Moire's fringes.

Polarization : Concept and analytical treatment of unpolarised, plane polarized and elliptically polarized light. Double refraction, Nicol prism, sheet polarisers, retardation plates. Production and analysis of polarized light (quarter and half wave plates).