



Syllabus

PANJAB UNIVERSITY, CHANDIGARH

B.Sc. Sem. IV

Paper – B : OPTICS AND LASERS–II

(30 Hrs)

Unit - I

Laser Fundamentals: Derivation of Einstein relations, concept of stimulated emission and population inversion. Broadening of spectral lines, natural, collision and Doppler broadening. Line width, line profile. Absorption and amplification of a parallel beam of light passing through a medium. Threshold condition. Three level and four level laser schemes. Elementary theory of optical cavity, longitudinal and transverse modes.

Unit - II

Laser Systems and Fiber Optics: Types of lasers, Ruby and Nd : YAG lasers. He–Ne and CO₂ lasers—construction, mode of creating population inversion and output characteristics. Semiconductor lasers, Applications of lasers—a general outline, Holography. Fiber fundamentals, wave propagation and dissipation of energy applications.