SUBJECT NAME: **Optical Fiber Technology**

SUBJECT NO: **PH40230 LTP: 3-0-0; CRD- 3** Total No. of Lectures: 42

Basic Fiber Optics**:** Brief history, Maxwell's equation,
Modes: Concept of modes, TE & TM modes in slab waveguides, Modes in fiber, WKB Approximation

Fabrication of optical fibers, Light guidance mechanism in optical fiber, Numerical Aperture (NA), V-parameter
Fiber Characteristics: Loss mechanism, Evanescent field, Modal Dispersion, Ray Equation, Material Dispersion, Step Index and Graded Index Fibers, Single mode fiber, Cut off, Birefringence

Application of Optical Fiber: Fiber optics communication, Optical coupler, Coupled mode theory, Fiber Bragg Grating (FBG) theory and application, Fiber Amplifier

Advanced topics in fiber optics: Nonlinear optics in optical fibers, Specialty Fibers (Photonic Crystal Fibers), Applications of the specialty fibers, Kerr-effect and Self phase modulation (SPM), Modulation Instability (MI), Optical Soliton

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Refs. and texts:

1. Introduction to Fiber Optics: Ajoy Ghatak and K. Thyagarajan
2. Optical Electronics: Ajoy Ghatak and K. Thyagarajan
3. Optical Waveguide Theory: A.W. Snyder, J. Love
4. Nonlinear Fiber Optics: Govind. P. Agrawal