

SSP-S 404

2000-2001

ANDHRA UNIVERSITY
DEPARTMENT OF PHYSICS
II M.Sc. PHYSICS, II M.Sc. (TECH.) ELECTRONICS &
IV SEMESTER
P404: OPTICAL COMMUNICATIONS.
(Common for II M.Sc. SPACE PHYSICS – SP.404
& II M.Sc. ELECTRONICS –E404.)

SYLLABUS

Classification of Optical Fibers – features of fiber communication, optical fibers, structures and waveguide fundamentals, fiber modes and configurations, wave representation, mode theory for circular waveguides, wave equations. 5 Hrs.
Chapter : 2. of G.Keiser.

Step-index fibers – Numerical aperture and multipath dispersion, modes and rays, total dispersion in multimode and monomode fibers. 5 Hrs.
Combined effect of material and waveguided dispersion in monomode fibers, single mode fibers, mode dispersion, propagation characteristics. 5 Hrs.
Chapters : 2, 4 and 10 of J.Gowar.

Grade – index fibers – Number of guided modes, propagation constant, intermode dispersion, RMS intermode dispersion, intramode dispersion, total dispersion, mode coupling. 5 Hrs.
Chapter : 9. of J.Gowar.

Power Launching and coupling – source-to-fiber power launching, source output pattern, power coupling calculation, wavelength dependence. 8 Hrs.
Lensing schemes for coupling, fiber-to-fiber joints, splicing techniques. 2 Hrs.
Chapter : 5. of G.Keiser.

Non-linear optics – Self-focusing phenomena, second – harmonic generation. 5Hrs.
Parametric amplification, parametric oscillation, frequency – up conversion. 5 Hrs.
Chapter : 8 of A. Yariv.

Electron – optic modulation – E.O.effect in Crystals, E.O.retardation, E.O.amplitude modulation. 5 Hrs.
Phase modulation, E.O. beam deflection. 5 Hrs.
Chapter : 9. of A.Yariv.

BOOKS:

1. "Optical Fiber Communications" - G.Keiser.
2. "Optical Communication Systems" - J.Gowar.
3. "Opto – Electronics " - A. Yasiv.