RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Electronics & Communication Engineering, VIII-Semester

EC801- Optical Fibre Communication

PREREQUISITE:-Engineering Physics, Communication Engineering

COURSE OUTCOME:-

Students should be able to:

1. Understand Optical Fiber Communication System and itsparameters.
2. Analyze transmission characteristics of optical fiber
3. Understand the construction and operation of various optical sources anddetectors.
4. Performance analysis of opticalreceivers and study of fiber joints
5. Brief introduction of optical fibernetworks and amplifiers

Unit 1. Introduction to vector nature of light, propagation of light, propagation of light in a cylindrical dielectric rod, Ray model, wave model. Different types of optical fibers, Modal analysis of fiber. Optical fibres : Structure & wave guiding fundamentals, basic optical laws.

Unit 2. Signal degradation in Optical Fibre : Signal degradation on optical fiber due to dispersion and attenuation, intermodal and intramodal dispersion, Fabrication of fibers and measurement techniques like OTDR

Unit 3. Optical sources and detectors: LEDs, LASER diodes, Basic concepts of optical Sourcesvarious laser and LED structures, Optical detectors: basic principle of photo detection, PIN and avalanche photo diode, phototransistor, photo detector noise, detector response time.

Unit 4. Optical transceivers; Direct detection and coherent receivers, noise in detection process, digital receiver performance calculation, BER, System design, power budgeting, rise time budgeting; fibre joints, and splicing techniques, Optical fibre connectors.

Unit 5.Optical networks and amplifiers- Optical networks : Topologies, networks SONET and SDH. Optical amplifiers - EDFA, Raman amplifier, and WDM systemsPassive Optical Networks.

TEXT BOOKS RECOMMENDED:-

1. Senior J.M., Optical Fibre Communications: Principles & Practice, 2nd ed. 2001,PHI.
2. Agrawal Govind P., Fibre Optic Communication Systems, 5th ed. 2001, John Wiley & Sons, studentsed.
3. Black Uyless, Optical Networks and 3rd Genration Transport Systems, 3rd ed. 1998,Pearson.

REFERENCE BOOKS RECOMMENDED:-

1. Keiser G, Optical Fibre Communication, 5th ed. 2006, McGrawHill.
2. Mynbanv and Scheiner, Fibre Optic Communication Technology, 2n^{d} ed 2010, PearsonEdu.
3. Djfar K Mynbaev &Scheiner, Fibre Optic Communication Technology, 5th ed. 2005,Pearson