**IQRA NATIONAL UNIVERSITY**

**DEPARTMENT OF COMPUTER SCIENCE**

**COURSE PLAN OF Optical Communication System**

Mansoor Qadir

**Course Objective:**

The purpose of this course is to give a brief knowledge about the Optical fibers and the working principles associated with Optical Communication Systems.

**Text Book:**

1. Fiber Optic Communication Technology by Djafar k. Mynbaev and Lowell L. Scheiner.
2. Optical Fiber Communications – Principles and Practice by John M. Senior.

**Course Outline:**

General Introduction about Telecommunication, the Basic Blocks. Physics of Light: A Brief Overview Electromagnetic Waves and Beams, A stream of photons, Attenuation, Intermodal and chromatic Dispersion, Single Mode Fibers, Light Source and Transmitter Light Emitting Diodes (LEDs) & Laser Diodes (LDs) and its Characteristics. Components of Fiber Optics Networks, Transceivers for Fiber Optic Networks, Semiconductor Optical Amplifiers, Erbium – Doped Fiber Amplifiers (EDFAs). FTTx, PON.

**Topics Included In the Course**

**Semester Plan**

|  |  |  |
| --- | --- | --- |
| **Week #** | **Content** |  |
| Week 1: | Introduction to Telecommunication and Fiber Optics  General Introduction about Telecommunication  A Fiber Optic Communication System: The Basic Blocks |  |
| Week 2: | **Physics of Light : A Brief Overview**   * Electromagnetic Waves and Beams |  |
| Week 3: | **Physics of Light : A Brief Overview**   * A stream of photons |  |
| Week 4: | **Optical Fiber - Basics**   * Optical Fiber Phenomena |  |
| Week 5: | **Optical Fiber - Basics**   * Attenuation | Assignment 1 |
| Week 6: | **Optical Fiber – Basics**   * Intermodal and chromatic Dispersion * Bit rate and Bandwidth Defined | Quiz 1 |
| Week 7: | **Single Mode Fibers - Basics**   * Working Principles of single Mode fiber |  |
| Week 8: | **Single Mode Fibers – Basics**   * Attenuation * Dispersion and Bandwidth |  |
| Week 9: | **Light Source and Transmitter - Basics**   * Light Emitting Diodes (LEDs) | Assignment 2 |
| Week 10: | **Light Source and Transmitter - Basics**   * Laser Diodes (LDs) * The Characteristics of Laser Diodes |  |
| Week 11: | **Components of Fiber Optics Networks**   * Fiber Optic Networks : An Overview | Quiz 2 |
| Week 12: | **Components of Fiber Optics Networks**   * Transceivers for Fiber Optic Networks |  |
| Week 13: | **Components of Fiber Optics Networks**   * Semiconductor Optical Amplifiers |  |
| Week 14: | **Components of Fiber Optics Networks**  Erbium – Doped Fiber Amplifiers (EDFAs) |  |
| Week 15: | **Advance topics in Optical Communication**   * FTTH/PON | Assignment 3 |
| Week 16: | Revision | Quiz 3 |