|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **JAIPUR ENGINEERING COLLEGE AND RESEARCH CENTER** | | | | | |
| **Department of ECE** | | | | | |
| **LECTURE PLAN** | | | | | |
| **Subject: OPTICAL FIBER COMMUNICATION**  **Subject Code: 6EC6.3A** | | **Year: III**  **Semester: VI** | | | |
|  | | | | | |
| **No. of Lecture Req. /(Avl.): 38/(40)** | |  |  |  |  |
| **Unit No./ Total lect. Req.** | **Topics** | **Lect. Req.** | **Lect. No.** | **Date of Delivery** | **Remark/ Actual lect. Taken** |
| **Unit-1**  **(08)** | 1. Introduction, Ray theory, Optical fibers | 1 | 1 |  |  |
| 2. Transmission Characteristics of Optical Fibers like Attenuation, Material absorption loss, Fiber bend loss, scattering | 1 | 2 |  |  |
| 3. Optical fibers: multimode, single mode, step index, | 1 | 3 |  |  |
| 4. Intermodal & Intramodal dispersion, Dispersion Shifted Fibers, Dispersion Compensating Fiber. | 1 | 4 |  |  |
| 5.Manufacturing of Optical Fibers and preparation of optical fiber | 1 | 5 |  |  |
| 6. Liquid phase techniques | 2 | 7 |  |  |
| 7. Vapour phase depositions techniques. | 2 | 9 |  |  |
| 8. Test | 1 | 10 |  |  |
| **Unit-2**  **(08)** | 1. **Laser-** Emission and absorption of radiation | 2 | 12 |  |  |
| 2. Einstein relation, Absorption of  radiation | 1 | 13 |  |  |
| 3. Population inversion, Optical feedback, Threshold condition. Population Inversion and threshold. | 1 | 14 |  |  |
| 4. Working of three levels & four level lasers. Basic idea of solid state, semiconductors, gas & liquid laser, Q**-**switching and mode locking. | 1 | 15 |  |  |
| 5. Light Emitting Diode **-** Structure, Material, Characteristics, Power & Efficiency.and standing wave ratio | 2 | 17 |  |  |
| **Unit- 3 (07)** | 1. Optical detection principles | 2 | 19 |  |  |
| 2. Quantum efficiency, Responsivity,  PIN photo diode, Avalanche photo diodes, | 2 | 21 |  |  |
| 3. Noise in Detectors, Photo Diode  Materials. | 2 | 23 |  |  |
| 4. Optical Connectors - Fiber Alignment, | 1 | 24 |  |  |
| 5 Fiber splices | 2 | 27 |  |  |
| 6. Fiber connectors | 2 | 29 |  |  |
| 7. Fiber connectors, expanded beam connectors, fiber couplers. | 1 | 30 |  |  |
| **Unit-4**  **(07)** | 1. Measurements of Fiber Attenuation, Dispersion, Refractive Index Profile | 1 | 31 |  |  |
| 2. Cut off Wave Length, Numerical Aperture & Diameter. | 1 | 32 |  |  |
| 3. Field measurement through optical  time domain reflectometry | 1 | 33 |  |  |
| 4. Laser based systems for measurement of distance, Velocity, Holography. | 1 | 34 |  |  |
| **Unit-5**  **(08)** | 1. Wavelength division multiplexing | 1 | 35 |  |  |
| 2. DWDM, active and passive components | 1 | 36 |  |  |
| 3. Optical sensors, optical amplifiers. | 1 | 37 |  |  |
| 4. public network applications, military, civil and industrial applications | 1 | 38 |  |  |
|  |  |  |  |  |  |