Name of the faculty : DEVENDER SINGH

Discipline : ECE

Semester : 5th

Subject : **OPTICAL FIBER COMMUNICATION**

Lesson plan Duration : 15 week

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| **Theory** | | |  | |
| **Week** | **Lecture Day** | **Topic**  **(Including Assignment test)** | **Practical** | **Topic** | |
| 1st | 1 | Introduction  Historical perspective | 1 | 1)To set up fiber analog link | |
|  | 2 | Basic communication systems | 2 |
|  | 3 | Optical frequency range, | 3 |
| 2nd | 4 | Advantages of optical fibre communication, application of fibre optic communication | 4 | 2)To set up optic digital link | |
|  | 5 | Electromagnetic spectrum used Advantages and disadvantages of optical  communication. | 5 |
|  | 6 | Principle of light penetration, | 6 |
| 3rd | 7 | Reflection, critical angle. | 7 | 3)To measure bending losses in optical fibers | |
|  | 8 | Optical Fibers and Cables | 8 |
|  | 9 | Fiber types construction, | 9 |
| 4th | 10 | Multimedia and monomode fibers, | 10 | 4)To observe and measure the splice or connector loss | |
|  | 11 | Step index and graded  index fibers, acceptance angle | 11 |
|  | 12 | and acceptance types of optical fiber cables. | 12 |
| 5th | 13 | Losses in optical fiber cable:  a) Absorption Losses, | 13 | 5)To measure and calculate numerical aperture of optical fiber | |
|  | 14 | Scattering Losses, | 14 |
|  | 15 | Radiation losses, | 15 |
| 6th | 16 | Compelling losses,  . | 16 | 6)To observe characteristics of optical source | |
|  | 17 | Bending loses. | 17 |
|  | 18 | Dispersion, Material dispersion | 18 |
| 7th | 19 | ,Wave guide dispersion, | 19 | 7.To observe characteristics of optical defector | |
|  | 20 | Modal dispersion total  dispersion and bit rate | 20 |
|  | 21 | Light sources and Detectors | 21 |
| 8th | 22 | a) Characteristics of light source used in optical communication, | 22 | 8. To Connectorise a fiber with connector at both ends | |
|  | 23 | Principle of  operation of LED, | 23 |
|  | 24 | Different type of LED structures used and their brief description, | 24 |
| 9th | 25 | LED driving circuitry, Injection Laser diode, | 25 | 9. Introduction to various components and tools used in optical fiber communication | |
|  | 26 | principle of operation, different  injection laser diodes | 26 |
|  | 27 | Comparison of LED and ILD, non semiconductor laser. | 27 |
| 10th | 28 | Characteristics of photo detectors used in optical communication | 28 | 10. A visit to nearby Telephone Exchange | |
|  | 29 | ; PIN diode and Avalanche photo diode (APD), their brief description. | 29 |
|  | 30 | Connectors, Splicing and coupling | 30 |
| 11th | 31 | Fiber alignment and joint losses, | 31 | Revise 1st Practical | |
|  | 32 | splicing, types of splices, | 32 |  | |
|  | 33 | types of connectors used,  couplers | 33 |
| 12th | 34 | , three and four port coupler, stare coupler, fiber optic switch. | 34 | Revise 2nd Practical | |
|  | 35 | 6. Optical Fiber System  Optical transmitter circuit, | 35 |
|  | 36 | optical receiver circuit | 36 |
| 13th | 37 | , optical power budgeting, multiplexing  methods used. | 37 | Revise 3rd Practical | |
|  | 38 | Modulation methods used.. | 38 |
|  | 39 | Introduction to SDH, SONET | 39 |
| 14th | 40 | Revision | 40 | Revise 4th Practical | |
|  | 41 | Revision | 41 |
|  | 42 | Revision | 42 |
| 15th | 43 | Revision | 43 | Revise 5th Practical | |
|  | 44 | Revision | 44 |
|  | 45 | Revision | 45 |