

## LESSON PLAN

**Branch:** IV ECE 'C'      **Semester:** II  
**Academic year:** 2016-17

**Subject :** Optical Communications and Networks  
**faculty :** Swathi jallu

| Period | Date<br>(Tentative) | Topic  | Unit No. | Teaching<br>Methodology | Remarks | Corrective Action<br>upon Review |
|--------|---------------------|--|----------|-------------------------|---------|----------------------------------|
| 1.     | 26.12.2016          | Introduction to Optical fiber communications, General system. Advantages | I        | Black Board             |         |                                  |
| 2.     | 27.12.2016          | Introduction to optical fiber Waveguides - Ray theory transmission       | I        | B.B                     |         |                                  |
| 3.     | 29.12.2016          | Total internal reflection, acceptance angle                              | I        | B.B                     |         |                                  |
| 4.     | 30.12.2016          | Numerical aperture, modes  | I        | B.B                     |         |                                  |
| 5.     | 30.12.2016          | V number, mode coupling. Step index fibers                               | I        | B.B                     |         |                                  |
| 6.     | 02.01.2017          | Graded index fibers  | I        | B.B                     |         |                                  |
| 7.     | 03.01.2017          | Single mode fibers- cutoff wavelength                                    | I        | B.B                     |         |                                  |
| 8.     | 05.01.2017          | Mode field diameter, Effective refractive index                          | I        | B.B                     |         |                                  |
| 9.     | 06.01.2017          | Fiber materials, Attenuation losses,                                     | I        | B.B                     |         |                                  |
| 10.    | 06.01.2017          | Absorption losses  | I        | B.B                     |         |                                  |
| 11.    | 09.01.2017          | Scattering and bending losses  | I        | B.B                     |         |                                  |
| 12.    | 10.01.2017          | Core and cladding losses, Related problems                               | I        | B.B                     |         |                                  |
| 13.    | 17.01.2017          | Optical sources-LEDs, Structures   | II       | PPT                     |         |                                  |
| 14.    | 19.01.2017          | Materials  | II       | PPT                     |         |                                  |
| 15.    | 20.01.2017          | Quantum efficiency   | II       | PPT                     |         |                                  |
| 16.    | 20.01.2017          | Power, Modulation, Power bandwidth product.                              | II       | PPT                     |         |                                  |
| 17.    | 23.01.2017          | Injection laser diodes-Modes, threshold conditions                       | II       | PPT                     |         |                                  |
| 18.    | 24.01.2017          | external quantum efficiency  | II       | PPT                     |         |                                  |
| 19.    | 27.01.2017          | Optical Detectors- physical principles of PIN and APD                    | II       | PPT                     |         |                                  |
| 20.    | 27.01.2017          | Detector response time   | II       | PPT                     |         |                                  |
| 21.    | 30.01.2017          | Temperature effect on Avalanche gain                                     | II       | PPT                     |         |                                  |
| 22.    | 31.01.2017          | Comparison of photo detectors  | II       | PPT                     |         |                                  |
| 23.    | 06.02.2017          | Related problems   | II       | PPT                     |         |                                  |
| 24.    | 07.02.2017          | Dispersion-Information capacity determination                            | III      | PPT                     |         |                                  |
| 25.    | 09.02.2017          | Group delay  | III      | PPT                     |         |                                  |
| 26.    | 10.02.2017          | Types of dispersions-  | III      | PPT                     |         |                                  |

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|-----|------------|--|-----|-----|--|--|
|     |            | Material dispersion  |     |     |  |  |
| 27. | 10.02.2017 | Waveguide dispersion   | III | PPT |  |  |
| 28. | 13.02.2017 | Polarization dispersion  | III | PPT |  |  |
| 29. | 14.02.2017 | Intermodal dispersion  | III | PPT |  |  |
| 30. | 16.02.2017 | Intermodal dispersion  | III | PPT |  |  |
| 31. | 17.02.2017 | Pulse broadening   | III | PPT |  |  |
| 32. | 17.02.2017 | Power launching into fiber                                       | III | PPT |  |  |
| 33. | 20.02.2017 | power launching  | III | PPT |  |  |
| 34. | 21.02.2017 | Related problems   | III | PPT |  |  |
| 35. | 23.02.2017 | Optical receiver operation-<br>fundamental receiver<br>operation | IV  | PPT |  |  |
| 36. | 24.02.2017 | digital signal transmission                                      | IV  | PPT |  |  |
| 37. | 24.02.2017 | Error sources  | IV  | PPT |  |  |
| 38. | 27.02.2017 | Receiver configuration   | IV  | PPT |  |  |
| 39. | 28.02.2017 | Digital receiver performance                                     | IV  | PPT |  |  |
| 40. | 02.03.2017 | Probability of error   | IV  | PPT |  |  |
| 41. | 03.03.2017 | Optical system design-<br>considerations                         | IV  | PPT |  |  |
| 42. | 03.03.2017 | Multiplexing   | IV  | PPT |  |  |
| 43. | 06.03.2017 | Point to Point links- System<br>considerations                   | IV  | PPT |  |  |
| 44. | 07.03.2017 | Link power budget  | IV  | PPT |  |  |
| 45. | 13.03.2017 | Rise time budget   | IV  | PPT |  |  |
| 46. | 14.03.2017 | Problems   | IV  | PPT |  |  |
| 47. | 16.03.2017 | Overview of fiber optic<br>networks, Transreceiver               | V   | PPT |  |  |
| 48. | 17.03.2017 | Semiconductors optical<br>amplifiers                             | V   | PPT |  |  |
| 49. | 17.03.2017 | Couplers/splicers  | V   | PPT |  |  |
| 50. | 20.03.2017 | Wavelength division MUX<br>and DEMUX                             | V   | PPT |  |  |
| 51. | 21.03.2017 | Filters, Isolators   | V   | PPT |  |  |
| 52. | 23.03.2017 | Optical switches   | V   | PPT |  |  |
| 53. | 24.03.2017 | Basic fiber optic networks                                       | V   | PPT |  |  |
| 54. | 24.03.2017 | WDM networks   | V   | PPT |  |  |
| 55. | 27.03.2017 | Optical CDMA   | V   | PPT |  |  |

#### **TEXT BOOKS :**

1. Optical Fiber Communications – Gerd Keiser, Mc Graw-Hill International edition, 3rd Edition, 2000.
2. Optical Fiber Communications – John M. Senior, PHI, 2nd Edition, 2002.

#### **REFERENCE BOOKS :**

1. Fiber Optic Communications – D.K. Mynbaev , S.C. Gupta and Lowell L. Scheiner, Pearson Education, 2005.
2. Text Book on Optical Fibre Communication and its Applications – S.C.Gupta, PHI, 2005.
3. Fiber Optic Communication Systems – Govind P. Agarwal , John Wiley, 3rd Edition, 2004.
4. Fiber Optic Communications – Joseph C. Palais, 4th Edition, Pearson Education, 2004.
5. Fiber Optics Communications – Harold Kolimbris (Pearson Education Asia)