

AMI17 OPTOELECTRONIC INSTRUMENTATION

UNIT-1 INTERFEROMETERS

- 1.1 Fabry- perot and Michelson interferometers- Interference filters
- 1.2 Interferometric method of measurement- Interference filters
- 1.3 Interferometric method of measurement of optical components- Optical spectrum analyzer.

UNIT-2 MODULATION OF LIGHT

- 2.1 Birefringence- Optical activity- Electro optic effect
- 2.2 Kerr modulators- magneto- optic devices
- 2.3 Acoustic optic modulators display devices
- 2.4 Luminescence- Electroluminescence
- 2.5 Injection Luminescence- Light emitting diode
- 2.6 Plasma displays- Liquid crystal displays.

UNIT-3 LASERS

- 3.1 Principles of operation- Einstein relations
- 3.2 Population inversion- Optical feedback
- 3.3 Laser modes- Classes of laser- Solid state, gas and liquid dye lasers
- 3.4 Semiconductor lasers- Q-switching and mode locking- Properties of laser light.

UNIT-4 APPLICATION OF LASERS

- 4.1 Distance measurement- Holography- Principles and applications
- 4.2 Industrial, biomedical and Pollution monitoring applications
- 4.3 Laser speckle and applications- optical fibers- light guidance through fibers
- 4.4 Step index and graded index fibers
- 4.5 Multimode and single mode fibers- Fiber fabrication.

UNIT-5 MEASUREMENT OF FIBER CHARACTERISTICS

- 5.1 Attenuation, dispersion and refractive index profile measurement
- 5.2 OYDER- fiber optic components- couplers, splicers and connectors
- 5.3 Applications of optical fibers- optical fiber communication- fiber optic sensors
- 5.4 Measurement of temperature, pressure, displacement, acceleration, strain, fluid level, current and voltage.

Reference Books:

1. J.Wilson and J.F.B.Hawkes – Optoelectronics: An Introduction – Prentice Hall of India.
2. K.Thygarajan and A.K.Ghatak – Lasers: Theory and Applications – Plenum Press
3. O.Svelto – Principles of Lasers – Plenum Press