4th Semester	REL4G002	Optoelectronic Device and Instrumentation	L-T-P 3-0-0	3 CREDITS

Module - I   (10 Hrs.)

Wave Optics: Wave Polarization, Transmission of light through slab, Numerical aperture, Wave propagation in cylindrical waveguides, Modes in step and graded index fibers, single mode and multimode fibres.

Module – II   (10 Hrs.)

Optical Components: Sources: LED, Lasers-fundamentals, conditions for oscillations, construction and principle of operation of semiconductor lasers, pulsed and continuous type lasers

Module - III   (08 Hrs.)

Fiber optic components: (at college level) couplers, splicer, polarizer, power coupled to a fibre Detectors: photodiodes- PIN and APD.

Module - IV   (10 Hrs.)

Optoelectronic Instrumentation: Modulation techniques: intensity, polarization, interference, electro-optic, electromagnetic; Sensing techniques for displacement, pressure, acceleration, flow, current and voltage measurement.

Module - IV   (07 Hrs.)

 Fiber optic gyroscope, Distributed fiber optic sensors- OTDR and OFDR principles.

Books:

- A. Ghatak and K. Tyagrajan: Introduction to Fiber Optics: Cambridge University Press, New Delhi, 2004. (Chapter 2, Sections 7.2-7.3, Chapter 3, Sections 4.3,8.2, 17.2, 17.8, Section 11.3, 11.6, Chapter 12, Chapter 18)
- A. Tripathy, Opto-Electronics and Systems: Studium Press, New Delhi, 2016

- R.P.Khare: Fibre Optics & Optoelectronics, Oxford University Press, New Delhi, 2010.
- John M. Senior, Optical Fibre Communications, Principles and Practice, 3rdEdn, Pearson, 2010
- J.P. Bentley- Principles of Measurement Systems (3/e), Pearson Education, New Delhi, 2007.
- J. Wilson and J.F.B. Hawkes: Optoelectronics: An Introduction (2/e), PHI, New Delhi, 2001. (Chapter 1, Sections 3.1-3.2; 8.1-8.2, Sections 8.3-8.4, 8.5, Sections 4.6, 5.1-5.6, 5.10.2, 7.2, Sections 3.4, 3.7, 3.8, Chapter 10)