YEAR- III	LASER AND FIBER OPTIC COMMUNICATION	PH612S
SEMESTER - VI		HRS/WK-5
CORE -10		CREDIT-4

UNIT - I : LASER Physics

Basic Principle of Laser – Einstein Coefficients – condition for light amplification – Population Inversion – Threshold Condition – Line shape function – Optical Resonators – Three level and four level systems.

UNIT - II : Types of lasers and output modulation methods

Solid State lasers – Gas lasers – He-Ne and CO_2 lasers – semiconductor lasers – Heterojunction lasers - Argon ion and Eximer Laser– Q switching and mode locking.

UNIT - III : Applications of laser

Application of laser in industry – cutting and welding – Drilling – surface Hardening – Medical applications - laser as diagnostic and therapeutic tool – Holography – Theory of recording and reconstruction – application of Holography.

UNIT - IV : Optic fibers

Fiber optic revolution – basic characteristics of optical fiber – acceptance angle – numerical aperture – propagation of light through optical fiber – theory of mode formation – classification of fibers – step index and graded index fibers – single mode and multi mode fibers – losses in fibers – fabrication techniques of fibers.

UNIT - V : Fiber Optic Communication

Source and detectors for fiber optic communication – Laser and LED – Analog and digital modulation methods – principle of optical detection – pin and APD photodetectors – Noise – Design consideration of a fiber optic communication system.

Text Books

1. Laser theory and applications by K. Thyagarajan and Ajoy Ghatak, Cambridge University Press, 1999.

2. An Introduction to laser : Theory and Applications by M N Avadhanulu, S. Chand & Co., New Delhi 2001.

3. Introduction to Fiber optics by K. Thyagarajan and Ajoy Ghatak, Cambridge University Press, 1999.

References

1. Optical Fiber communications by john M. Senior, Cambridge University Press, 1996.
2. Fiber – Optic communication systems, Govind p. Agrawal, John- Willey & Sons.
3. P K Palanisamy, Physics for engineering, Scitech publishing pvt Ltd., Chennai.