

Third year of Five Years integrated M.Sc (Physics)  
M.Sc. - III, Semester –VI

	L	T	P	C
MP 306 : Laser Physics and Fiber Optics	3	0	0	3

- **PRINCIPLE OF LASERS** (04 Hours)  
Spontaneous and Stimulated Emissions, Einstein's A & B coefficients, Optical pumping and population inversion
- **COMPONENTS OF LASERS** (04 Hours)  
The active medium, pumping mechanisms, optical resonators
- **TYPES OF LASERS:** Ruby, Nd:YAG, He-Ne, Carbon dioxide, Semiconductor Junction laser, Argon laser, Organic dye laser, (10 Hours)
- **APPLICATIONS OF LASERS:** In Civil and Mechanical Engineering, Electronics and Electrical Engineering, (02 Hours)
- **OPTICAL FIBERS:** Structures, Modes, Materials, Types and wave propagation (08 Hours)
- **FIBER MATERIALS:** Glass fibers, Plastics-Clad-Glass fibers and Plastic fibers. Comparison of optical fiber Cables with conventional metallic cables and advantages. Elements of an optical fiber. (06 Hours)
- **ATTENUATION MEASUREMENTS :** Power launching and coupling; Source to fiber power launching, fiber to fiber joints, mechanical misalignment. Splicing techniques; V groove butt splice, fusion splice and Elastic-tune-splice. Optical fiber connectors. (08 Hours)

(Total Contact Time (Theory): 42 Hours)

**BOOKS RECOMMENDED :**

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|-------------------------------------|--|-----------------------|------|
| 1. Ghatak A. K., and Thyagrajan, K. | <i>Lasers: Theory and applications</i> | Springer              | 1981 |
| 2. Siegman A.M.E,                   | <i>An Introduction to lasers and</i>   | McGraw-Hill Education | 1971 |
| 3. Keiser G.,                       | <i>Optical Fiber communication,</i>    | McGraw-Hill Education | 1991 |
| 4. Ghatak A. K., and Thyagrajan, K  | <i>Fibre optics essentials</i>         | Wiley-IEEE            | 2007 |
| 5. Hoss R. J. and Lacy E. A.,       | <i>Fiber optics,</i>                   | Prentice Hall;        | 1993 |