

In The Name Of GOD

**Course:** Laser and its Applications in Medicine

**Field:** Medical Physics (MSc)

**Credit:** 1

**Topics:**

- EM Wave Spectrum
- Light Matter Interaction-Classic/Quantum
- Absorption/Spontaneous Emission/Stimulated Emission
- Linear/Nonlinear Polarization
- Radiation- Einestein Coefficient- Black Body Radiation
- Two/Three/Four Level System
- Laser Structure-Gain Medium
- Axial-Transverse Modes
- Fiber Optics
- Laser Types
- Pulsed Laser- Q Switch- Mode Locked
- Biomedical Application of Laser (Photochemical, Photothermal, Photoablation, Plasma-induced ablation)
- Photothermal & Photodynamic Therapy.
- Clinical Application of Laser (Ophtalmology, Dermatology, Cardiology, ORL Head-Neck, Urology Neurology, Dentistry).
- Laser Safety

**References:**

- Laser Fundamentals: *Silfvast*, Cambridge University Press
- Lasers for Medical Applications : Diagnostics, Therapy and Surgery: *Jelinkova*, ELSEVIER SCIENCE & TECHNOLOGY.
- Fundamentals of Photonics: *Saleh*, Wiley