Laser-tissue interactions
Thematics

1. The most common laser types in medicine
   Gas lasers (He-Ne, CO_2, Ar^+-ion, excimer lasers)
   Liquid or dye lasers
   Solid state lasers (YAG, semiconductor lasers, fiber lasers)

2. Main types of light-matter interactions
   Reflection, Transmission, Scattering (coherent, incoherent), Absorption

3. General characteristics, types and roles of medical laser equipment

4. Effects of laser beam on living tissues (photothermal, photochemical, photodisruption, ablation effects)

5. Laboratory and Clinical diagnostics
   Laser microanalysis, Laser spectroscopy, Laser blood flowmetry,
   Optical coherence tomography (OCT),
   Fiber optic diagnostics,
   Photodynamic diagnostics and therapy,
   Photosensitive materials,
   Detection and selective destruction of cancer tissues

6. Soft Laser Therapy
   Mechanism of action, practical applications,
   Laser acupuncture
   Advantages, disadvantages and conditions of application of soft laser therapy

7. Laser surgery
   Practical applications in Ophthalmology, Neurosurgery, Otorhinolaryngology,
   Bronchology, Gastroenterology, Urology,
   Cardiovascular surgery, Plastic surgery,
   Dentistry and Oral surgery

8. Laser Safety

<u>Suggested reading:</u>

1. Markolf H. Niemz: Laser-Tissue Interactions, Fundamentals and Applications (Springer Science & Business Media, Berlin-Heidelberg 2007)
2. F. Dausinger, F. Lichtner, H. Lubatschowski: Femtosecond Technology for Technical and Medical Applications (Springer Science & Business Media, Berlin-Heidelberg 2004)

3. D. Shi: Biomaterials and Tissue Engineering (Springer Science & Business Media, Berlin-Heidelberg 2004)
4. D.K. Elliott: Ultraviolet Laser Technology and Applications (Academic Press Inc., 1995)