***Laser Biophotonics***

(special chapters)

Special course  
for 2nd year master students of the physics department

delivered in English

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Course outline

* Introduction
* Fundamentals of Light-Matter Interactions
* Principles of Lasers, Current Laser Technology and Nonlinear optics
* Photobiology
* Bioimaging: Principles, Techniques and Applications
* Optical Biosensors: Principles, Techniques and Applications
* Laser Measurement Techniques and Biomedical Applications
* In vitro and In vivo Cytometry including Flow Cytometry
* Light-Activated Therapy: Photodynamic Therapy
* Tissue Engineering with Light
* Laser Tweezers and Laser Scissors
* Nanotechnology for Biophotonics: Bionanophotonics
* Biomaterials for Photonics

**Literature**

1. Paras N. Prasad. Introduction to Biophotonics. John Wiley & Sons, Inc., Hoboken, New Jersey, USA - 2003.
2. Handbook on Optical Biomedical Diagnostics, V.V. Tuchin –Editor, SPIE Publ., USA, 1st Edition – 2002 (Russian translation – Fizmatlit, Moscow 2007); 2nd Edition - 2016.
3. V.V. Tuchin. Tissue Optics: Light Scattering Methods and Instruments for Medical Diagnostics. (Russian translation – Fizmatlit, Moscow - 2013).
4. Handbook on Coherent-Domain Optical Methods; Biomedical Diagnostics, Environmental and Material Science. V.V. Tuchin – Editor, Kluwer Acad. Publ., Boston-Dordrecht-London – 2013.