



Joint Master's program Biomedical Engineering

X4M 2335 Photonics II and Laser Application	Lecture, 2 SWS Lab/ project 2 SWS
Credit-points:	5
Lecturer:	Fred Reinholz
Language:	English
Curriculum:	Master's program Biomedical Engineering, 2nd Semester
Prerequisites according to examination regulations	None
Recommended prerequisites:	Photonics I Knowledge in mathematics, physics and optics
Learning outcomes:	<p>The student should know and apply the principles of modern optics. Specifically the student will gain an insight in the special conditions for the use of lasers and modern optics in Biology and Medicine.</p> <p>The students should be able to present a certain topic of modern Photonics or Biomedical Optics to other students.</p> <p>During the practical part the students will get hands-on experience on the use of optical components. They will have learned to conduct experiment and to evaluate experimental results.</p>
Content:	<ul style="list-style-type: none"> • Laser, interferometry, and holography • Spectroscopy, nanophotonics • Laser-tissue interaction • Biomedical applications and laser medicine
Literature:	<p>Lakowicz: Principles of Fluorescence Spectroscopy</p> <p>Demtröder: Laser Spectroscopy</p> <p>H.-P. Berlien, G.J.Müller, Applied Laser Medicine</p> <p>M. Niemz: Laser-Tissue Interactions, Springer 1996</p> <p>A.J. Welch, M. van Gemert: Optical-Thermal Response of Laser-Irradiated Tissue</p> <p>V. Tuchin, Handbook of Optical Biomedical ImagingT.</p> <p>Vo-Dinh, Biomedical Photonics Handbook</p> <p>P.N. Prasad, Introduction to Biophotonics</p>
Examination:	Written examination and graded lab reports
Teaching methods:	Lecture with beamer/blackboard, and experimental work in the lab/project