Module Photonics II

Module Name: Photonics II

Module Number	**X4M 2335**	Level	Master	Short Name	Photonics II
Responsible Lecturers	Prof Dr. Gereon Hüttmann Dr Fred Reinholz				
Department, Facility	UZL, Institute of Biomedical Optics				
Course of Studies	Biomedical Engineering, Master				
Compulsory/elective	Elective	ECTS Credit Points	4		
Semester of Studies	2	Semester Hours per Week	4		
Length (semesters)	1	Workload (hours)	100		
Frequency	SuSe	Presence Hours	60		
Teaching Language	English	Self-Study Hours	40		
Consideration of Gender and Diversity Issues	☒ Use of gender-neutral language (THL standard) ☐ Target group specific adjustment of didactic methods ☐ Making subject diversity visible (female researchers, cultures etc.)				
Applicability	Biomedical Engineering				
Remarks	None				

Module Photonics II

Module Photonics II

Course 1: Photonics II Lecture and lab

Course Number		Short Name	Photonics II
Course Type	Lecture and lab	Form of Learning	Presence
Mandatory Attendance	☒	ECTS Credit Points	4
Participation Limit	None	Semester Hours per Week	4
Group Size (practical training, exercises, …)	2 to 3 students per experiment	Workload (hours)	100
Teaching Language	English	Presence Hours	60
Study Achievements („Studienleistung“, SL)	Graded lab reports	Self-Study Hours	40
SL Length (minutes)	n. a.	SL Grading System	lab report template
Exam Type	Written Exam (2/3) & lab report marks (1/3)	Exam Language	English
Exam Length (minutes)	90	Exam Grading System	One-third Grades
Learning Outcomes	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. The students should be able to present a certain topic of modern Photonics or Biomedical Optics to other students. 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.		
Participation Prerequisites	Knowledge in mathematics, physics and optics		
Contents	• Laser, interferometry, and holography • Spectroscopy, nanophotonics • Laser-tissue interaction • Biomedical applications and laser medicine		
Literature	Lakowicz: Principles of Fluorescence Spectroscopy Demtröder: Laser Spectroscopy H.-P. Berlien, G.J.Müller, Applied Laser Medicine M. Niemz: Laser-Tissue Interactions, Springer 1996 A.J. Welch, M. van Gemert: Optical-Thermal Response of Laser-Irradiated Tissue V. Tuchin, Handbook of Optical Biomedical ImagingT.		

Module Photonics II

	Vo-Dinh, Biomedical Photonics Handbook P.N. Prasad, Introduction to Biophotonics
Remarks	Lecture with video projector/blackboard, and experimental work in labs