

Advanced Light Microscopy					
Identification number	Workload	Credits	Term of studying	Frequency of occurrence	Duration
MN-B-SM (BG2)	360 h	12CP	1 st or 2 nd term of studying	Summer term, 1 st half	7 weeks
1	Type of lessons		Contact times	Self-study times	Intended group size*
	a) Lectures		15 h	24 h	max. 8
	b) Practical/Lab		162 h	132 h	max. 2-3
	c) Seminar		3 h	24 h	max. 2
2	Aims of the module and acquired skills Students who successfully completed this module ... <ul style="list-style-type: none"> • have acquired theoretical and experimental skills in state-of-the art microscopy methodologies. • are able to plan, carry out and evaluate a project using advanced microscopy and quantitative image analysis independently, as they will carry out individual research projects (4 weeks). • have learned how to present research results in oral and written form and to critically discuss scientific publications related to the topic of the module on a professional level. • are able to transfer skills acquired in this module to other fields of biology. 				
3	Contents of the module <ul style="list-style-type: none"> • Optical principles of light microscopy • Design, build, and characterize a light microscope • Advanced fluorescence techniques (including FCS, FRET and FLIM) • Multi Photon microscopy • Single cell and single molecule techniques • Superresolution microscopy (STED and dSTORM) <p><i>Explanatory note:</i> To gain insight into state-of-the art methodologies the course will start with a combination of a lecture series and hands-on experience introducing different techniques (two weeks). Four weeks of the course will be dedicated to designing and carrying out individual projects making use of advanced microscopy and image analysis in groups of two.</p>				
4	Teaching/Learning methods <ul style="list-style-type: none"> • Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form 				
5	Requirements for participation Enrollment in the Master's degree course "Biological Sciences" or in the Master's degree course "Biochemistry"				

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6	<p>Type of module examinations</p> <p>The final examination consists of three parts: Two hours written examination about topics of the lectures (50 % of the total module mark), oral presentation (25 % of the total module mark) and seminar paper (25 % of the total module mark)</p>
7	<p>Requisites for the allocation of credits</p> <p>Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)</p>
8	<p>Compatibility with other Curricula</p> <p>Biological subject module in the Master´s degree course "Biochemistry"</p>
9	<p>Significance of the module mark for the overall grade</p> <p>In the Master´s degree course "Biological Sciences": 15 % of the overall grade (see also appendix of the examination regulations)</p>
10	<p>Module coordinator</p> <p>Dr. Astrid Schauss, phone 478-84027, e-mail: aschauss@uni-koeln.de</p>
11	<p>Additional information</p> <p>Subject module of the Master´s degree course "Biological Sciences", Focus of research: (B) Biochemistry, Biotechnology and Biophysics; (G) Genetics and Cell Biology Participating faculty: Dr. A. Schauss, Prof. Dr. B. Maier</p> <p>Literature:</p> <ul style="list-style-type: none"> • Reviews and original papers will be handed out during the module <p>General time schedule: Week 1-6 (Mon.-Fri.): Lectures and practical/lab, writing seminar paper and preparation for the seminar talk (topic and date will be arranged individually); Week 7 (Mon.-Fri): Preparation for the written examination</p> <p>Note: The module contains hand-on laboratory work conducted by small groups of students and is taught in research laboratories. The module does not contain computer-based practicals/research as a main component.</p> <p>Introduction to the module: April 06, 2018 at 10:00a.m., MPI Age (Joseph-Stelzmann-Str. 9b), seminar room 1 (ground floor)</p> <p>Written examination: May 28, 2018; more details will be given at the beginning of the module</p>

*6 students from the Master´s degree course "Biological Sciences" and 2 student from the Master´s degree course "Biochemistry".