Introduction to Electron Microscopy						
Identification number		Workload	Credit points	Term of studying	Frequency of occurence	Duration
MN-B-SM (BG 3)		360 h	12 CP	1st or 2nd term of studying	Winter term, 2nd half	7 weeks
1	Type of lessons		Contact times	Self-study times	Intended group size	
	a) Lectures		15 h	24 h	max. 6	
	b) Practical/Lab		162 h	132 h	max. 2	
	c) Seminar		3 h	24 h	max. 2	
2	Aims of the module and acquired skills Students who successfully completed this module … • have acquired theoretical and experimental skills in state-of-the art electron microscopy methodologies. • are able to plan, carry out and evaluate a project using electron microscopy and 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 • Principles of transmission electron microscopy • Principles of scanning electron microscopy • Basic EM preparation techniques (embedding, cutting, contrasting) • Advanced EM preparation techniques (Tokuyaso with Immunogold, negative staining) • Electron Tomography • Hands-on experience in transmission and scanning electron microscopy • Correlative light and electron microscopy *Explanatory note:* 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.					
4	Teaching/Learning methods • 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”					

6	Type of module examinations 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)
7	Requisites for the allocation of credits Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)
8	Compatibility with other Curricula Biological subject module in the Master´s degree course "Biochemistry"
9	Significance of the module mark for the overall grade In the Master´s degree course "Biological Sciences": 15 % of the overall grade (see also appendix of the examination regulations)
10	Module coordinator Dr. Astrid Schauss, phone 478-84027, e-mail: aschauss@uni-koeln.de
11	Additional information 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, Dr. F. Nitsche Literature: • Reviews and original papers will be handed out during the module 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 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. Introduction to the module: November 29, 2019 at 10.30 a.m. CECAD research centre, Joseph-Stelzmann-Str. 26, seminar room (first floor) Written examination: January 31, 2020, second/supplementary examination March 20, 2020; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.