Neural Function II: Neurons, Networks and Behavior						
Identificationnumber	**Workload**	**Creditpoints**	**Term ofstudying**		**Frequencyofoccurence**	**Duration**
M-Neuro-AM4 a-c	360 h	12CP	1st or 2nd term of studying		Summer term, 2ndhalf	7 weeks
1	**Type of lessons**	**Contact times**	**Self-study times**	**Intended group size***		
	a) Lectures	20 h	40 h	max. 14		
	b) Practical/Lab	100 h	160 h	max. 2		
	c) Seminar	10 h	30 h	max. 14		
2	**Aims of the module and acquired skills** Students who successfully completed this module … • have acquired detailed knowledge about concepts and experimental approaches in the analysis of neuronal networks • are trained in preparations and intracellular and/or extracelluarrecording techniques to study neural network functions, and rhythmic motor behavior in different model systems, from invertebrates to vertebrates (see contents of the module). • are able to independently design and perform small scientific projects related to topics of the module. • have applied data analyses using the high level programming language Matlab and/or the Spike2 software package. • 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** • Analysis of rhythmic motor behavior in lamprey, crustaceans (stomatogastric nervous system and swimmeret system),and insects (drosphilaand stick insect) • Electrophysiological and pharmacological analysis of neuronal networks • Functional properties of neuronal networks and generation of rhythmic activity • Different extracellular and intracellular recording techniques of neuronal activity • Techniques in recording motor behavior in insects • Staining techniques for neurons and microscopy • Data analysis with Matlab					
4	**Teaching/Learning methods** • Lectures; Practical/Lab (Project work); Seminar; Computer modeling; 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 "Experimental and Clinical Neurosciences" Participation in the module *Essentials in Neuroscience* of the MSc Biology program in the winter term. Alternatively, participation in the module *Neural Function I: From Experiments to Analysis*.
6	**Type of module examinations** The final examination consists of two parts: 30 min oral examination about topics of the lectures and the practical/lab part (70 % of the total module mark) and oral presentation (30 % of the total module mark)
7	**Requisites for the allocation of credits** Regular and active participation; Passed seminar paper; Each examination part at least "sufficient" (see appendix of the examination regulations for details)
8	**Compatibility with other Curricula*** Elective module in the Master´s degree course "Biological Sciences"
9	**Significance of the module mark for the overall grade** In the Master´s degree course "Experimental and Clinical Neurosciences": 12 % of the overall grade (see also appendix of the examination regulations)
10	**Module coordinator** Prof.Dr. Ansgar Büschges, phone 470-2607, e-mail: ansgar.bueschges@uni-koeln.de
11	**Additional information** **Subject module** of the Master´s degree course "Biological Sciences", **Focus of research:** (N) Neurobiology **Participating faculty:** Prof. Dr. A. Büschges, Dr. T. Bockemühl, Dr. M. Gruhn, Dr. C. Guschlbauer, Dr. G. Lundkvist, Prof. Dr. M. Nawrot, PD Dr. J. Schmidt, Dr. C. Wellmann **Literature:** • Literature will be delivered in the course **General time schedule:** Week 1-6 (Mon.-Fri.): Lectures, practical/lab, analysis of self-acquired data with Matlab, and preparation of oral project presentation(held at the end of week 6) as well as writing seminar paper; Week 7 (Mon.-Fri): Preparation for the oral examination **Note:** The module contains hands-on laboratory work conducted individually and is taught in research laboratories. The module does not contain computer-based practicals/research as a main component. **Introduction to the module:**May25, 2020 at 9:00 a.m., Cologne Biocenter, room 1.007 (first floor) **Oral examination:** July 17, 2020, second/supplementary examination August 28, 2020; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.

*8 students from the Master´s degree course "Biological Sciences" and 6 students from the Master´s degree course "Experimental and Clinical Neurosciences".