

Neural Function II: Neurons, Networks and Behavior					
Identification number	Workload	Credits	Term of studying	Frequency of occurrence	Duration
MN-B-SM (N 3)	360 h	12CP	1 <sup>st</sup> or 2 <sup>nd</sup> term of studying	Summer term, 2 <sup>nd</sup> half	7 weeks
<b>1</b>	<b>Type of lessons</b>		<b>Contact times</b>	<b>Self-study times</b>	<b>Intended group size*</b>
	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
<b>2</b>	<b>Aims of the module and acquired skills</b> Students who successfully completed this module ... <ul style="list-style-type: none"> <li>• have acquired detailed knowledge about concepts and experimental approaches in the analysis of neuronal networks</li> <li>• are trained in preparations and intracellular and/or extracellular recording techniques to study neural network functions, and rhythmic motor behavior in different model systems, from invertebrates to vertebrates (see contents of the module).</li> <li>• are able to independently design and perform small scientific projects related to topics of the module.</li> <li>• have applied data analyses using the high level programming language Matlab and/or the Spike2 software package.</li> <li>• 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.</li> <li>• are able to transfer skills acquired in this module to other fields of biology.</li> </ul>				
<b>3</b>	<b>Contents of the module</b> <ul style="list-style-type: none"> <li>• Analysis of rhythmic motor behavior in lamprey, crustaceans (stomatogastric nervous system and swimmeret system), and insects (drosophila and stick insect)</li> <li>• Electrophysiological and pharmacological analysis of neuronal networks</li> <li>• Functional properties of neuronal networks and generation of rhythmic activity</li> <li>• Different extracellular and intracellular recording techniques of neuronal activity</li> <li>• Techniques in recording motor behavior in insects</li> <li>• Staining techniques for neurons and microscopy</li> <li>• Data analysis with Matlab</li> </ul>				
<b>4</b>	<b>Teaching/Learning methods</b> <ul style="list-style-type: none"> <li>• Lectures; Practical/Lab (Project work); Seminar; Computer modeling; Guidance to independent research; Training on presentation techniques in oral and written form</li> </ul>				

*Neural Function II: Neurons, Networks and Behavior (MN-B-SM [N 3]) continued*

5	<p><b>Requirements for participation</b></p> <p>Enrollment in the Master´s degree course "Biological Sciences" or in the Master´s degree course "Klinische und Experimentelle Neurowissenschaften"</p> <p>Participation in the module <i>Essentials in Neuroscience</i> of the MSc Biology program in the winter term. Alternatively, participation in the module <i>Neural Function I: From Experiments to Analysis</i>.</p>
6	<p><b>Type of module examinations</b></p> <p>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)</p>
7	<p><b>Requisites for the allocation of credits</b></p> <p>Regular and active participation; Passed seminar paper; Each examination part at least "sufficient" (see appendix of the examination regulations for details)</p>
8	<p><b>Compatibility with other Curricula*</b></p> <p>Elective module in the Master´s degree course "Klinische und Experimentelle Neurowissenschaften"</p>
9	<p><b>Significance of the module mark for the overall grade</b></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><b>Module coordinator</b></p> <p>Prof.Dr. Ansgar Büschges, phone 470-2607, e-mail: ansgar.bueschges@uni-koeln.de</p>
11	<p><b>Additional information</b></p> <p><b>Subject module</b> of the Master´s degree course "Biological Sciences", <b>Focus of research:</b> (N) Neurobiology</p> <p><b>Participating faculty:</b> 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</p> <p><b>Literature:</b></p> <ul style="list-style-type: none"> <li>• Literature will be delivered in the course</li> </ul> <p><b>General time schedule:</b> 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</p> <p><b>Note:</b> 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.</p> <p><b>Introduction to the module:</b> May 25, 2020 at 9:00 a.m., Cologne Biocenter, room 1.007 (first floor)</p> <p><b>Oral examination:</b> 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.</p>

\*8 students from the Master´s degree course "Biological Sciences" and 6 students from the Master´s degree course "Klinische und Experimentelle Neurowissenschaften".