Module Name							
Neural Function I: Neural Basis of Motor Behavior in Animals							

Type of Module				Module Code			
o Advanced Module				Neural Function I			

Identification Number	Workload	Credit Points	Term	Offered Every	Start		Duration
MN-B-SM (N 1)	360 h	12 CP	2nd term of studying	Summer term	summer term only		7 weeks

1	Course Types	Contact Time	Private Study	Planned Group Size*
	a) Lectures	20 h	40 h	max. 12
	b) Practical/Lab	100 h	160 h	max. 2
	c) Seminar	10 h	30 h	max. 12

2	Module Objectives and Skills to be Acquired
	Students who successfully completed this module
	• have acquired an understanding of how the nervous system generates locomotion in vertebrates and invertebrates
	• have acquired an understanding about the role of brain signals for initiation and maintenance of locmotion, the role of intersegmental signals exchanged between neural networks within the ventral nerve cord and spinal cord to coordinate locomotor activity and the role of sensory signals in shaping the motor activity in a task-specific fashion.
	• are able to apply electromyographic, extracellular and intracellular recording techniques used in neurobiology and are able to independently design and perform small scientific projects related to topics of the module.
	• have acquired basic programming skills with the high level programming language Matlab.
	• are able to anlyze electrophysiological data using Matlab and the Spike 2 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	Module Content
	• Basic properties of neuronal and excitable membranes
	• Intra- and extracellular recordings of motor activity in invertebrates and vertebrates
	• Identification of building blocks of neural circuits generating rhythmic or patterned motor output for behavior
	• Pharmacological induction of neural network activity
	• Staining techniques and fluorescence microscopy
	• Analysis of electrophysiological data with Matlab

4	Teaching Methods
	Lectures; Practical/Lab (Project work); Seminar; Computer exercises with Matlab; Guidance to independent research; Training on presentation techniques in oral and written form

5	**Prerequisites (for the Module)**
	Enrollment in the Master´s degree course "Biological Sciences" or in the Master´s degree course "Klinische und Experimentelle Neurowissenschaften"
	Additional academic requirements
	Previous attendance of the lecture module "Neurobiology: Genes, Circuits, and Behavior (N)". The knowledge of neurobiology on the level of a general biology text book (Campbell or Purves) is absolutely required.
6	**Type of Examination**
	The final examination consists of two parts: oral presentation (20-30 min; 50 % of the total module mark), written report (50 % of the total module mark)
7	**Credits Awarded**
	Regular and active participation 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 "Clinical and Experimental Neurosciences"
9	**Proportion of Final Grade**
	15 % 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	**Further Information**
	Subject module of the Master´s degree course "Biological Sciences", **Specialization:** (N) Neurobiology: Genes, Circuits, and Behavior
	Participating faculty: Prof. Dr. A. Büschges, Dr. T. Bockemühl, Dr. M. Gruhn, Dr. C. Manziaris, PD Dr. J. Schmidt
	Literature:
	• Information about textbooks and other reading material will be given during the course
	General time schedule: Week 1-6 (Mon.-Fri.): Lectures, practical/lab and preparation for the seminar talk (held at the end of week 6); Week 7 (Mon.-Fri): Preparation for the oral examination and the written report. The written report shall be handed in 3 weeks after the end of the module.
	Note: The module contains hands-on laboratory work conducted individually and is taught in course rooms. The module contains computer-based practicals as a complementary component.
	The teaching language of the course is English.
	Introduction to the module: April 04, 2022 at 9:00 a.m., Cologne Biocenter, room 1.007 (first floor); for preparation to the module before this introduction see advice(s) under literature
	Oral examination: May 20th, 2022, second/supplementary examination July 21st, 2022; 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 "Klinische und   Experimentelle Neurowissenschaften".