Module Name
Neural Function II: Analyzing the Neural Underpinnings of Behavior – from Structure through Function to Behavior

Type of Module	**Module Code**
o Advanced Module	Neural Function II

Identification Number	**Workload**	**Credit Points**	**Term**	**Offered Every**	**Start**	**Duration**
MN-B-SM (N 4)	360 h	12 CP	2nd term of studying	Summer term, 2nd half	Summer term only	7 weeks

1	**Course Types**	**Contact Time**	**Private Study**
	a) Lectures	16 h	44 h
	b) Practical/Lab	100 h	160 h
	c) Seminar	10 h	30 h

2 Module Objectives and Skills to be Acquired

Students who successfully completed this module

- Will be able to give detailed account about concepts and experimental approaches in the analysis of behavior and its neural basis
- Will be able to perform preparations and techniques to study neural network function, and rhythmic motor behavior in different model systems (see contents of the module).
- Will be able to independently design and perform small scientific projects related to topics of the module.
- Will be able to analyze data, e.g. by using the programming language Matlab, the Spike2 software package or software for anatomical analysis.
- Will be able 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.
- Will be able to transfer skills acquired in this module to other fields of biology.

3 Module Content

- Analysis of motor behavior in arthropods and vertebrates (e.g. cockroach, mouse, fruit fly and stick insect)
- Techniques in monitoring and recording motor behavior in different insect model systems
- Behavioral and electrophysiological analysis of neuronal network performance
- Optogenetic approaches for electrophysiological research
- Data analysis with Matlab

4 Teaching Methods

- Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form

5	**Prerequisites (for the Module)** Enrollment in the Master of Science degree program "Neuroscience" or in the Master's degree program "Experimental and Clinical Neuroscience" **Additional academic requirements** Previous attendance of the lecture module Neuroscience (winter term)
6	**Type of Examination** The final examination consists of two parts: Oral examination (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 graded at least "satisfactory" (see appendix of the examination regulations for details)
8	**Compatibility with other Curricula*** Optional compulsory module in the Master's degree program "Experimental and Clinical Neuroscience"
9	**Proportion of Final Grade** 12.0 %
10	**Module Coordinator** Prof. Dr. Ansgar Büschges, phone 470 2607, e-mail: ansgar.bueschges@uni-koeln.de
11	**Further Information** **Participating faculty:** Prof. Dr. A. Büschges, Dr. G. di Cristina, Dr. E.A. Gorostiza, Dr. M. Gruhn, Prof. Dr. G. Gatto, Prof. Dr. M. Nawrot, guests **Literature:** • Information about textbooks and other reading material will be given on the ILIAS platform of the course **General time schedule:** Week 1-6 (Mon.-Fri.): Lectures, practical/lab, analysis of self-acquired data, preparation of writing written report; Week 7 (Mon.-Fri.): Preparation for the oral presentation and completing of the written report **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:** June 08th, 2026 at 10:00 a.m., Cologne Biocenter, room 1.007 (first floor) or online (in this case, further information/link will be sent to your smail-Account); for preparation to the module before this introduction see ILIAS link under literature. **Oral examination:** July 23, 2026, second/supplementary examination August 28, 2026; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.