Course title: Neural Function I: From Experiments to Analysis						
Identification number	**Workload**	**Credit points**	**Term of studying**		**Frequency of occurence**	**Duration**
M-Neuro-AM2 a-c	360 h	12 CP	1st or 2nd term of studying		Summer term, 1st half	7 weeks

1	**Type of lessons**	**Contact times**	**Self-study times**	**Intended group size***
	a) Lectures	20 h	40 h	max. 16
	b) Practical/Lab	100 h	160 h	max. 2
	c) Seminar	10 h	30 h	max. 16

2 Aims of the module and acquired skills

Students who successfully completed this module …

- have acquired a solid understanding of important cellular electrophysiological methods.
- are able to apply intracellular recording and imaging techniques used in neurobiology(see contents of the module) 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 Contents of the module

- Basic properties of excitable membranes
- Functional analysis of membrane properties and neuronal activity
- Intracellular recordings of neuronal activity
- Analysis of synaptic interaction of neurons
- Pharmacological analysis of membrane properties
- Intracellular staining techniques and fluorescence microscopy
- Analysis of electrophysiological data withMatlab

4 Teaching/Learning methods

- Lectures; Practical/Lab (Project work); Seminar; Computer exercises with Mathlab; 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 “Klinische und Experimentelle Neurowissenschaften”

Additional academic requirements: Participation in an advanced neurobiology/animal physiology course within a bachelor’s program (e.g. MN-B-WP I [Neuro 1] at University of Cologne) is highly desirable. The knowledge of neurobiology on the level of a general biology text book (Campbell or Purves) is absolutely required.

6	**Type of module examinations** The final examination consists of two parts: Two hours written examination about topics of the lectures, the practical/lab part and the seminars (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** PD Dr. Joachim Schmidt, phone 470-6135, e-mail: joachim.schmidt@uni-koeln.de
11	**Additional information** **Subject module** of the Master´s degree course "Biological Sciences", **Focus of research:** (N) Neurobiology **Participating faculty:** Dr. T. Bockemühl, Dr. M. Gruhn, Dr. S. Hess, Prof. Dr. P. Kloppenburg, Prof. Dr. M. Nawrot, 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) as well as writing seminar paper; Week 7 (Mon.-Fri): Preparation for the written examination **Note:** The module contains hands-on laboratory work conducted individually and is taught in course rooms. The module does not contain computer-based practicals/research as a main component. The teaching language of the course is English. **Introduction to the module:** April 01, 2019 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 **Written examination:** May 17, 2019, second/supplementary examination July 26, 2019; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.

* 11 students from the Master´s degree course "Biological Sciences" and 5 students from the Master´s degree course "Experimental and Clinical Neurosciences".