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| **Module Title: Neural Function II: Neurons, Networks and Behavior** |
| **Identification-Nr.**M-MN-N-NeuroM02 | **Workload**360h | **Credit Points**12CP | **Frequency of Occurence**Summer term, 2nd half | **Duration**7 weeks |
| 1 | **Type of lessons**1. Lectures
2. Practical/Lab
3. Seminar
 | **Contact times**1. 20h
2. 100h
3. 10h
 | **Self-study times**1. 40h
2. 160h
3. 30h
 | **Intended group size\***1. max. 12
2. max. 2
3. max. 12
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| 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 extracellular recording techniques to study the neural network functions, and rhythmic motor behavior in different model systems from invertebrates to vertebrates (see content of the module).
* are able to independently design and perform small scientific projects related to

topics of the module.* Have applied data analysis 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 the skills acquired in this module to other fields of biology.
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| 3 | **Contents of the module*** Analysis of rhythmic motor behavior in lamprey, crustaceans (stomatogastric nervous system and swimmeret system)
* Electrophysiological and pharmacological analysis of neural networks
* Functional properties of neural networks and generation of rhythmic activity
* Different extracellular and intracellular recording techniques of neural activity
* Techniques in recording motor behavior in insects
* Staining techniques for neurons and microscopy
* Data analysis with Matlab
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| 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 “Klinische und Experimentelle Neurowissenschaften”Participation in the module Neural Function I: From Experiments to Analysis. In cases of doubt, please contact PD Dr. Joachim Schmidt (joachim.schmidt@uni-koeln.de) |
| 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 “Klinische und Experimentelle Neurowissenschaften” |
| 9 | **Significance of the module mark for the overall grade**In the Master´s degree course “Experimental and Clinical Neuroscience”: 12 % of the overall grade (see also appendix of the examination regulations) |
|  10 | **Module coordinator:** Prof. Dr. Ansgar Büschges, phone 470-2607, ansgar.bueschges@uni-koeln.de **Participating faculty:** Prof. Dr. A. Büschges, Dr. T. Bockemühl, Dr. M. Gruhn, Dr. C. Guschlbauer, Prof. Dr. M. Nawrot, PD Dr. J. Schmidt, Dr. C. Wellmann |
| 11 | **Additional information****Subject module** of the Master´s degree course “Biological Sciences”,**Focus of research:** (N) Neurobiology**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:** June 12, 2017 at 9:00 a.m., Cologne Biocenter, room 1.007 (first floor) **Oral examination:** July 28, 2017; more details will be given at the beginning of the module |

**\*** Gemäß Studienverlaufsplan (s. Anlage 1 der Prüfungsordnung)

**\*** 7 students from the Master’s degree course “Biological Sciences” and 5 students from the Master’s degree course “Klinische und Experimentelle Neurowissenschaften”