module code / module title

MN-NE / Neuro- and Electrophysiology

date / version of the module description	23.02.2023

1	**INFORMATION ON THE MODULE**	
1a	module code	MN-NE
1b	module title *(German title)*	
1c	module title *(English title)*	Neuro- and Electrophysiology
1d	credit points	9 CP
1e	responsible for the module	Prof. Dr. Andreas Kreiter
1f	type of module	elective module
1g	programs using the module	M. Sc. Neurosciences
1h	organizational unit offering the module	
1i	content-related prior knowledge or skills	There is a PVL (prerequisite for the examination) in this module which has to be passed before starting the lab work to certify competence in safe handling of lab animals. The PVL consists of the passed project report required in the examination of module Laboratory Animal Science (Module MN-S2). .
1j	learning contents	• Basics of electrical engineering and measurement technology for neuroscientists • Building a measuring chain for microelectrode recordings • Stereotactic surgery and recording • Planning a neurophysiological recording experiment • Performing neuronal single- and multi-unit recordings in the mammalian cortex

		• Generation and testing of neurobiological hypotheses • Quantitative, computer-based data analysis of neurophysiological and behavioral data • Reporting and presentation of neurophysiological results
1k	learning outcomes/ competencies/ targeted competencies	Students • have a fundamental understanding of electrical engineering and measurement technology aspects required in electrophysiological experiments • are capable to build up an electrophysiological measurement chain for microelectrode recordings • can use stereotactic atlases for planning stereotactic recording experiments • can plan and organize all aspects of an electrophysiological recording experiment to test specific neurobiolocal hypotheses • are able to perform microelectrode recordings in the mammalian cortex including surgery and anesthesia • know fundamental methods for analyzing single- and multi-channel electrophysiological data for hypothesis testing and are able to perform them by using and developing data analysis scripts • can explain the neurobiology of sensory systems
1l	calculation of student workload *(part a: calculation of presence time and working hours)*	**The total amount of the presence time and working hours of the module has to be calculated additionally in the detailed calculation a) to c).** **a)** detailed calculation: **SWS / presence time/working hours in each course of the module**

☒	1	lecture(s) with	1	SWS/ contact hours	14	hours of presence time
☒	1	seminar(s) with	1	SWS/ contact hours	14	hours of presence time
☐		exercise(s) with		SWS/ contact hours		hours of presence time
☐		internship(s) with		sum of working hours		
☐		seminar(s) with		SWS/ contact hours		total hours of presence time
☒	1	laboratory/laboratories with	6	SWS/ contact hours	84	total hours of presence time
☐		tutorial(s) with		SWS/ contact hours		
☐		excursion(s) with		SWS contact hours in total		working hours

		☐ other form of course (e.g. block seminar), namely this: Klicken Sie hier, um Text einzugeben. with SWS / with totaly contact hours ☐ presence time ☐ working hours = sum of presence time and working hours: 112
	calculation of student workload *(part b: preparation time and follow-up work/self-study)*	**b) working hours for preparation/follow-up work of the course(s) and/or self-study** = sum of working hours: 144
	calculation of student workload *(part c: exam preparation etc.)*	**c) exam preparation (incl. examination)** = sum of working hours: 14
	calculation of student workload *(total amount of hours including a) - c))*	**Total amount of the presence time and working hours a) to c):** 270
1m	description of possible optional courses in the module	*Can a student choose between different courses within the module?* NO *Short description of selection option* Klicken Sie hier, um Text einzugeben.
1n	language(s) of instruction	☐ German ☒ English ☐ Spanish ☐ French ☐ Other, namely this: Klicken Sie hier, um Text einzugeben.
1o	frequency	*(regular cycle module is offered) e.g.: winter semester, yearly or summer semester, yearly or each semester* summer semester yearly Klicken Sie hier, um Text einzugeben.
1p	duration	Other, namely this: The main part of the module is a block course of four weeks, with preparatory/ follow-up-work throughout the whole semester

1q	Literature (*optional*)	Klicken Sie hier, um Text einzugeben.
1r	more information on the module (*optional*)	limited to 6 students
2	**INFORMATION ON THE MODULE EXAMINATION** (see also AT Art. 5 section 8)	
2a	type of examination	☐ module exam; i.e. exam with only one component (MP) ☒ combination exam, i.e. exam with several components (administered by instructors) (KP) ☐ partial exam; i.e. exam with several components (administered by registrar) (TP)
2b	exam components or prerequisites *(type, number)*	***PL*** *= graded component of the examination* ***SL*** *= ungraded component of the examination, coursework* ***PVL*** *= prerequisite of the examination (see AT Art. 5 Section 10)* ☒ PL | 2 ☐ SL | ☒ PVL | justification If necessary, further explanations: PVL: The PVL is a project report and has to be passed before starting the lab work to certify competence in safe handling of lab animals. The PVL consists of the passed project report required in the examination of module Laboratory Animal Science (Module MN-S2).
2c	Give this information for combination examinations only: Weights (in percentage) of component grades	PL 1: 50% protocol PL 2: 50% oral presentation PL 3: Klicken Sie hier, um Text einzugeben. PL 4: Klicken Sie hier, um Text einzugeben. If necessary, further comments: Klicken Sie hier, um Text einzugeben.
2d	form of examination (see AT BPO/AT MPO Art. 8, 9 and 10)	☐ Assignment ☐ Oral examination (single) ☒ Presentation, oral ☐ Written examination ☐ Group examination, oral ☐ Presentation and written assignment ☐ Portfolio ☒ Project report ☐ Bachelor Thesis ☐ Internship report ☐ Colloquium ☐ Master Thesis ☒ Other (concrete definition is given in the examination regulations): Protocol The project report is the PVL
2e	language(s) of instruction	☐ German ☒ English ☐ Spanish ☐ French ☐ Other, namely this: Klicken Sie hier, um Text einzugeben.