Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Module Catalogue

for the Subject

Translational Neuroscience

as a Master's with 1 major

with the degree "Master of Science"

(120 ECTS credits)

Examination regulations version: 2018
Responsible: Faculty of Medicine

Contents

The subject is divided into

Learning Outcomes

The Translational Neuroscience program at the Medical Faculty of Würzburg covers the following main areas:

- biological-scientific and clinical-theoretical basics
- constructive work in interprofessional and interdisciplinary teams
- basic, translational and clinical research
- diagnostic tools and therapeutic options

Scientific qualifications

- Graduates possess a professionally oriented, science-based education and apply scientific thinking and action in a targeted manner to gain new knowledge in medicine.
- They have a basic understanding of scientific work and use professionally legitimate methods of knowledge and testing procedures.
- They adequately assess the possibilities and limits of scientific knowledge in medicine.
- They critically evaluate scientific approaches and results and take their social responsibility and the well-being of patients into account.
- They are able to conduct systematic literature searches, independently derive new questions, formulate hypotheses and identify suitable research methods and apply these to their own scientific work.
- They comply with the principles of good scientific practice.

Qualification for scientific employment

- Graduates are prepared for a wide range of fields of action in professional institutions and in the private sector, for example in the areas of research, health, education and training, the world of work and culture.

Enabling social engagement

- They identify the ethical dimensions of scientific activity and deal with ethical challenges appropriately.
- They know and take into account the ethical, legal, societal and socio-economic framework conditions of scientific action.
- They communicate their knowledge and skills to others and apply the principle of lifelong learning.

Personality development

- They are capable of self-criticism, recognize their personal limits and can reflect on their responsibility and how they deal with their own mistakes.
- They are aware of the different roles in teams. They are able to recognize problems in working together and to offer constructive criticism, and they are prepared to take on leadership tasks and responsibility depending on the situation.

Abbreviations used

Course types: **E** = field trip, **K** = colloquium, **O** = conversatorium, **P** = placement/lab course, **R** = project, **S** = seminar, **T** = tutorial, **Ü** = exercise, **V** = lecture

Term: **SS** = summer semester, **WS** = winter semester

Methods of grading: **NUM** = numerical grade, **B/NB** = (not) successfully completed

Regulations: **(L)ASPO** = general academic and examination regulations (for teaching-degree programmes), **FSB** = subject-specific provisions, **SFB** = list of modules

Other: **A** = thesis, **LV** = course(s), **PL** = assessment(s), **TN** = participants, **VL** = prerequisite(s)

Conventions

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with

the general regulations governing the degree subject described in this module catalogue:

ASPO2015

associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

29-Jan-2019 (2018-64)

18-Dec-2019 (2019-62)

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.

Compulsory Courses

(50 ECTS credits)

Module title			Abbreviation
Methods in Neurosciences			03-TN-MNS-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Molecular techniques, microscopic methods, immunohistochemistry, mouse models and gene-knockout approaches, protein and molecular biology techniques, PCR, advanced protein biochemistry, imaging techniques, biodistribution of imaging biomarkers, pain behaviour, gait analysis, biostatistics of psychiatric genetic studies, mouse brain neuroanatomy with a focus on neuromorphology and adult neurogenesis, neural stem cells.

Intended learning outcomes

Students are able to review and expand their knowledge of standard molecular techniques and are able to choose methods and techniques to design experiments in a specific research area of neurosciences.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + P (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) oral examination of one candidate each (30 to 60 minutes) or
c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
d) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Clinical Neurobiology 1			03-TN-NB1-152-m01
Module coordinator		**Module offered by**	
Institute of Clinical Neurobiology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will get a theoretical introduction and amplification of topics in clinical neurobiology. The following topics will be discussed: introduction to neurons and glia, ion channels and membrane potential, ion channelopathies, synapses, transmitter release, NMJ, myasthenia gravis, cerebellum, basal ganglia, ataxia and Morbus Parkinson, somatosensory system, touch, pain, schizophrenia and autism spectrum disorders, disorders of cognition, muscle and muscle diseases, anatomy and function of the motor system, spinal reflexes, motoneuron diseases, hippocampus, learning and memory, anterograde amnesia, visual agnosia, cortex and the limbic system, emotions, disorders of conscious and unconscious mental processes, attention, smell and taste and hearing , sleep, EEG, epilepsy, vision and diseases of the visual system. The accompanied literature seminars are based on fundamental and current literature on lecture-relevant topics to discuss experimental and methodological approaches and with this promoting translational thinking. Using student presentations of current research results, the earned knowledge in neurobiology is recessed

Intended learning outcomes

Students who successfully completed this module are able to remind and understand the current theoretical concepts in neurobiology. Furthermore, students are able to classify clinical aspects of neurobiology with the focus to disease mechanisms at molecular, cellular, and physiological levels. Based on current experimental data evaluation, students are able to critical read and evaluate current publications in neurobiology as well as extract relevant information from recent publications.

Courses (type, number of weekly contact hours, language — if other than German)

V (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) oral examination of one candidate each (30 to 60 minutes) or
c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)

Master's degree (1 major) Translational Neuroscience (2017)
Supplementary course Translational Medicine (2018)
Master's degree (1 major) Translational Medicine (2018)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Clinical Neurobiology 2: Trend-setting and current findings in neurobiology			03-TN-NB2-152-m01
Module coordinator		**Module offered by**	
Institute of Clinical Neurobiology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will get a theoretical introduction and amplification of topics in clinical neurobiology. The following topics will be discussed: introduction to neurons and glia, ion channels and membrane potential, ion channelopathies, synapses, transmitter release, NMJ, myasthenia gravis, cerebellum, basal ganglia, ataxia and Morbus Parkinson, somatosensory system, touch, pain, schizophrenia and autism spectrum disorders, disorders of cognition, muscle and muscle diseases, anatomy and function of the motor system, spinal reflexes, motoneuron diseases, hippocampus, learning and memory, anterograde amnesia, visual agnosia, cortex and the limbic system, emotions, disorders of conscious and unconscious mental processes, attention, smell and taste and hearing , sleep, EEG, epilepsy, vision and diseases of the visual system. The accompanied literature seminars are based on fundamental and current literature on lecture-relevant topics to discuss experimental and methodological approaches and with this promoting translational thinking. Using student presentations of current research results, the earned knowledge in neurobiology is recessed.

Intended learning outcomes

Students who successfully completed this module are able to remind and understand the current theoretical concepts in neurobiology. Furthermore, students are able to classify clinical aspects of neurobiology with the focus to disease mechanisms at molecular, cellular, and physiological levels. Based on current experimental data evaluation, students are able to critical read and evaluate current publications in neurobiology as well as extract relevant information from recent publications.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)

Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Neurology/ Neurosurgery 1			03-TN-NN1-152-m01
Module coordinator		**Module offered by**	
Department of Neurology, Department of Neurosurgery		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will get a theoretical introduction and scientific background from the following topics: antibody-mediated CNS diseases – experimental analysis of auto-antibody function; Lessons on nociceptor function learned from pain genetics; Translational approaches in stroke medicine; Subarachnoid hemorrhage - pathophysiology and translational therapy approaches; Pathophysiology of brain trauma: experimental brain trauma models and their analysis; Neurophysiology of hearing in tumor and trauma; The molecular basis of glioma-biology; Neuroplasticity after CNS damage by brain tumors; Connectomics in neurology; understanding neuronal networks for treatment of tremor syndromes; stem cell based models of movement disorders; basics of electrophysiology in experimental and clinical practice; the molecular basis of myopathies. The accompanied journal clubs are based on fundamental and current literature on lecture-relevant topics to discuss experimental and methodological approaches and with this promoting translational thinking. Students will give presentations and thereby earn and transfer knowledge.

Intended learning outcomes

Students who successfully completed this module will have acquired insights into the current molecular and cellular pathophysiology of diseases prevalent in neurology and neurosurgery. They will understand basic mechanisms of disease in the motor and sensory system and of higher functions. They will understand about brain trauma and brain tumor biology. They will have gained theoretical knowledge about animal models for neurological and neurosurgical diseases and will be introduced into behavioral, neurophysiological, morphological and molecular biological analysis methods. They will have learnt how to raise appropriate bed-to-bench research questions and how to devise study plans. They will learn how to read scientific publications critically and how to extract the relevant data bringing them forward in their own project. In addition, they will have learnt how to record and analyze data and how to present them in oral and written form.

Courses (type, number of weekly contact hours, language — if other than German)

V (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) oral examination of one candidate each (30 to 60 minutes) or
c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Neurology/ Neurosurgery 2			03-TN-NN2-152-m01
Module coordinator		**Module offered by**	
Department of Neurology, Department of Neurosurgery		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will get a theoretical introduction and scientific background from the following topics: antibody-mediated CNS diseases – experimental analysis of auto-antibody function; Lessons on nociceptor function learned from pain genetics; Translational approaches in stroke medicine; Subarachnoid hemorrhage - pathophysiology and translational therapy approaches; Pathophysiology of brain trauma: experimental brain trauma models and their analysis; Neurophysiology of hearing in tumor and trauma; The molecular basis of glioma-biology; Neuroplasticity after CNS damage by brain tumors; Connectomics in neurology; understanding neuronal networks for treatment of tremor syndromes; stem cell based models of movement disorders; basics of electrophysiology in experimental and clinical practice; the molecular basis of myopathies. The accompanied journal clubs are based on fundamental and current literature on lecture-relevant topics to discuss experimental and methodological approaches and with this promoting translational thinking. Students will give presentations and thereby earn and transfer knowledge.

Intended learning outcomes

Students who successfully completed this module will have acquired insights into the current molecular and cellular pathophysiology of diseases prevalent in neurology and neurosurgery. They will understand basic mechanisms of disease in the motor and sensory system and of higher functions. They will understand about brain trauma and brain tumor biology. They will have gained theoretical knowledge about animal models for neurological and neurosurgical diseases and will be introduced into behavioral, neurophysiological, morphological and molecular biological analysis methods. They will have learnt how to raise appropriate bed-to-bench research questions and how to devise study plans. They will learn how to read scientific publications critically and how to extract the relevant data bringing them forward in their own project. In addition, they will have learnt how to record and analyze data and how to present them in oral and written form.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in
Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title	Abbreviation
Psychiatric Neurosciences	03-TN-PSYT1-152-m01

Module coordinator	Module offered by
University Hospital, Department of Psychiatry, Psychosomatics and Psychotherapy	Faculty of Medicine

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Basic knowledge about the characteristics of various psychiatric disorders, the proposed neurobiological basis (e.g. gene by environment interaction) as well as the treatment approaches: Anxiety disorders, somatoform disorders, social interaction disorders, psychotic disorders, attention deficit hyperactivity disorder, substance use disorders, neurodegenerative disorders. Basic knowledge about the genetic and neural mechanisms associated with psychiatric disorders such as gene by environment interaction, anatomical, cellular/neuronal plasticity of selected brain regions, e.g. hippocampus and amygdala and brain regions and neurotransmitter systems involved in the processing of emotions. Basic knowledge about state-of-the-art research methods in the field such as the analysis of gene variants and their association with various psychiatric disorders and behavioral traits, animal models for psychiatric disorders, neuroimaging methods in humans.

Intended learning outcomes

Students who successfully completed this module will have gained an overview of the characteristics of diverse psychiatric disorders. They will have acquired insights into the neurobiological basis of the etiopathogenesis of these disorders (e. g. which neurotransmitter systems and brain regions are involved), how they are treated and into current concepts and experimental approaches studying these psychiatric disorders.

Courses (type, number of weekly contact hours, language — if other than German)

V (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) oral examination of one candidate each (30 to 60 minutes) or
c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)

Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Current findings in psychiatric neurosciences			03-TN-PSYT2-152-m01
Module coordinator			**Module offered by**
University Hospital, Department of Psychiatry, Psychosomatics and Psychotherapy			Faculty of Medicine
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The literature seminar is based on fundamental literature on lecture-relevant topics to document the experiments underlying our present knowledge in neuropsychiatric diseases.

Intended learning outcomes

Students will acquire a theoretical understanding of how methods in molecular biology work and will learn how to publish scientific results in the field of neurobiology/neuropsychiatry.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title	Abbreviation
Biopsychology 1	06-TN-BPSY1-152-m01

Module coordinator	Module offered by
holder of the Chair of Psychology I	Institute of Psychology

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Students will get a theoretical introduction and amplification of topics in biopsychology and cognitive neuroscience. The following topics will be discussed: introduction to biopsychological research methods (behavioral assessments, eye-tracking, autonomic psychophysiology, electroencephalography, structural and functional magnetic resonance imaging), emotion and motivation, learning and memory, attention, perception, cognitive control, clinical aspects (e.g., anxiety disorders, depression, addiction). The accompanying seminars are based on fundamental and current literature on lecture-relevant topics to discuss experimental and methodological approaches and with this promoting translational thinking. Using student presentations of current research results, the acquired knowledge in biopsychology is recessed.

Intended learning outcomes

Students who successfully completed this module are able to remind and understand the current theoretical concepts in biopsychology and cognitive neuroscience. Furthermore, students are able to describe and interpret biopsychological data and they can select appropriate non-invasive techniques to address specific psychological research questions. They are familiar with general psychological concepts and know about their biological basis. Based on this knowledge, students are able to critical read and evaluate current publications in biopsychology and cognitive neuroscience and can extract relevant information from recent publications.

Courses (type, number of weekly contact hours, language — if other than German)

V (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) oral examination of one candidate each (30 to 60 minutes) or
c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Biopsychology 2			06-TN-BPSY2-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Psychology I		Institute of Psychology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will get a theoretical introduction and amplification of topics in biopsychology and cognitive neuroscience. The following topics will be discussed: introduction to biopsychological research methods (behavioral assessments, eye-tracking, autonomic psychophysiology, electroencephalography, structural and functional magnetic resonance imaging), emotion and motivation, learning and memory, attention, perception, cognitive control, clinical aspects (e.g., anxiety disorders, depression, addiction). The accompanying seminars are based on fundamental and current literature on lecture-relevant topics to discuss experimental and methodological approaches and with this promoting translational thinking. Using student presentations of current research results, the acquired knowledge in biopsychology is recessed.

Intended learning outcomes

Students who successfully completed this module are able to remind and understand the current theoretical concepts in biopsychology and cognitive neuroscience. Furthermore, students are able to describe and interpret biopsychological data and they can select appropriate non-invasive techniques to address specific psychological research questions. They are familiar with general psychological concepts and know about their biological basis. Based on this knowledge, students are able to critical read and evaluate current publications in biopsychology and cognitive neuroscience and can extract relevant information from recent publications.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Advanced lab rotation 1			03-TN-LR1-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service in advance.	

Contents

Students get an intense training in at least two different methods from different fields of neurosciences.

Intended learning outcomes

Students have reinforced previously acquired lab skills, acquired new lab techniques and learned how to apply theoretical knowledge in the lab. Students have gained expertise in the analysis and presentation of raw data.

Courses (type, number of weekly contact hours, language — if other than German)

P (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

b) log (approx. 10 to 30 pages) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Compulsory Electives

(40 ECTS credits)

Module Group General Compulsory Electives

(ECTS credits)

Module title			Abbreviation
Pain			03-TN-P-152-m01
Module coordinator		**Module offered by**	
University Hospital, Department of Anaesthesia and Critical Care		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will receive a theoretical introduction and consolidation in topics of pain processing as well as clinical pain medicine. Contents include an introduction to nociceptors and their activation via specific ion channels, the pain pathway with its synapses, and the descending pathways. Clinically, the classification of pain and the major primary and secondary pain syndromes are discussed. Pain research will be reflected with the possibilities and limitations of preclinical animal models on the one hand and measurement of pain in patients on the other. A focus will also be on the translation of results from research for the clinic and drug development. The subsequent literature seminar will be based on fundamental and current literature on topics relevant to the lecture to discuss clinical studies, experiments and new methods and thereby promote translational thinking in pain medicine. Presentations of current research results and the connection to the clinic (examination of patients) and multimodal interdisciplinary therapy will be used to deepen the learned knowledge in pain medicine.

Intended learning outcomes

In this course, students will learn about the (patho-) physiology of pain, neuroanatomical structures and pain therapy including interdisciplinary multimodal pain therapy. These include molecular mechanism of pain, studying pain in animals and humans and drug development. How to evaluate studies in "pain" is worked-out by the students in a specific article/topic chosen by the student and presented within in a talk during the course.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + P (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)

Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Neuroinflammation			03-TN-NI-172-m01
Module coordinator		**Module offered by**	
Department of Neurology, Section of Developmental Neurobiology and Institute of Virology and Immunobiology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Introduction to neural cells and structures relevant for neuroinflammation (glial cells, myelin, myelin molecules, synapses, nodes of Ranvier), components of the innate immune system I: macrophages and microglial cells, components of the innate immune system II: dendritic cells, NK cells, granulocytes; antigen presentation; lymphatic organs, components of the adaptive immune system: lymphocytes and antigen recognition, the phenomenon of tolerance and autoimmunity, experimental models for neuroinflammation (EAE, cuprizone, EAN); the BBB, clinics, pathogenesis and therapy of multiple sclerosis, role of inflammation in primarily neurological/neurodegenerative disorders (Alzheimer's disease; inherited neuropathies).

Intended learning outcomes

Students who successfully completed this module will have acquired solid insights into fundamental and disease-relevant aspects of neuroimmunology and neuroinflammation. They will have learned to critically read scientific publications and will have been trained in the ability to extract relevant information from the original scientific literature.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + S (0)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) oral examination of one candidate each (30 to 60 minutes) or
c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
d) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Ion channels			03-TN-IC-152-m01
Module coordinator		**Module offered by**	
Institute of Clinical Neurobiology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will get a theoretical introduction and amplification of topics in ion channel physiology. The following topics will be discussed: physiological properties of membranes, structure-function relationships of ligand-gated and voltage-gated ion channels and their subfamilies, regulation and pharmacology of ion channels, anatomical expression profiles, developmental regulation, evolution of ion channels, sensory systems, ion channelopathies. The accompanied literature seminars are based on current publications of ion channel structures and physiological aspects to discuss experimental and methodological approaches and with this promoting translational thinking. Using student presentations of current research results, the earned knowledge on ion channels is recessed. The practical session will include whole cell recordings at the electrophysiological setup using transfected cells and primary neurons. Using various neurotransmitters and blocking agents, students will apply their learned knowledge of ion channel physiology and observe the consequences at the functional level.

Intended learning outcomes

Students who successfully completed this module are able to remind and understand the physiological properties of various ion channel families and their importance for brain physiology. The students are able to classify in a bottom-up approach to put the molecular findings into the context of pathomechanisms in various kinds of channelopathies. They will be trained in recording techniques to study ion channel properties on transfected/injected cell lines as well as primary neurons. With this experience, students are able to evaluate the applicability of electrophysiological recording techniques for various ion channels. Additionally, they are able to critically read, reflect, and present scientific reports in the field of channel physiology.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + S (0) + P (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) oral examination of one candidate each (30 to 60 minutes) or
c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
d) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in
Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Functional Neuroimaging			03-TN-FI-152-m01
Module coordinator		**Module offered by**	
University Hospital, Department of Nuclear Medicine		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Content: target identification for functional and molecular neuroimaging, basic concepts of radiochemistry, radiolabelling of surrogate markers for PET and SPECT, basic concepts of magnetic resonance imaging , basic concepts of positron emission tomography, single photon emission computed tomography and hybrid devices (PET/CT, SPECT/CT), anatomic and functional structures of the brain in small animals, anatomic and functional structures in humans and patients with neurodegenerative disorders and dementia, multimodality multiparametric imaging of brain tumours using MR, PET and SPECT.

Intended learning outcomes

Students who successfully completed this module will have acquired insights into current experimental approaches in neurobiology. They will have been introduced to preparations and recording techniques to study the function and pathomechanisms of neural model systems. The students will have examined clinical aspects of neurobiology with a focus on the molecular, cellular and physiological mechanisms. Additionally, they will have learned how to document their own data that they collected during lab courses. In addition, the students will have learned to critically reflect their data in the context of the experimental methods used.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)

Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title	Abbreviation
Developmental Neuroimaging	03-TN-DI-172-m01

Module coordinator	Module offered by
University Hospital, Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy	Faculty of Medicine

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Students will get an introduction to basic physics of MRI, in particular the functional MRI signal (so called BOLD response). Different fMRI designs, block vs. event, will be introduced. Students will learn to critically evaluate such design differences. The basic steps for preprocessing fMRI data will be introduced and practiced. Using example data of a block and event design, there will be an introduction and practice session on how to implement a statistical model of task-based fMRI data. Students will give presentation on the topics based on state-of-the-art textbooks and research articles or implement analysis code. The course requires the students to use Statistical Parametric Mapping software in Matlab. Previous experience in Matlab is not required but beneficial.

Intended learning outcomes

Students who successfully completed this module will have acquired insights into the basics principles of functional and structural MRI data collection as well as how to perform data preprocessing and principles of statistical analysis. Behavioral data from an experiment conducted during functional MRI will be analyzed and implemented into the statistical analysis of brain activation of controls and patients. As an outlook, we will touch on opportunities of informing such analysis by computational modeling.

Courses (type, number of weekly contact hours, language — if other than German)

S (0) + Ü (0)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)

Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title	Abbreviation
Regeneration in the nervous system	03-TN-PN-172-m01

Module coordinator	Module offered by
Department of Neurology, Section of Developmental Neurobiology	Faculty of Medicine

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Cellular elements of the PN I: origin, development, structure, myelin formation, Cellular elements of the PN II: lesion, regeneration and surgical reconstitution, physiology and pathophysiology, Diseases I: inflammatory (GBS, CIDP, myasthenia; clinic and therapy), Diseases II: diabetes; iatrogenic (e. g. vincristine; clinic and therapy), Diseases III: inherited NPs (including models and attempts for treatment approaches). The literature seminar is based on fundamental literature on lecture-relevant topics to document the experiments underlying our present knowledge in peripheral nerve research.

Intended learning outcomes

Students who successfully completed this module will have acquired insights into cellular elements of the peripheral nerve, physiology and pathophysiology. The students will have examined clinical aspects of diseases with the involvement of peripheral nerves with a focus on the molecular mechanisms and therapeutical options. Additionally, they will have learned how to evaluate and present data in oral form. In addition, the students will have learned to critically read scientific publications in the field of peripheral nerve diseases and will have been trained in the ability to extract relevant information from the original literature.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + S (0)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)

Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Developmental Neuropsychiatry			03-TN-DNP-172-m01

Module coordinator	Module offered by
University Hospital, Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy	Faculty of Medicine

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Students will get an introduction to the main conditions in child and adolescent psychiatry as well as to state-of-the-art neuroscientific models of etiology and pathophysiology. There will be a focus on ADHD, anxiety disorders, autism spectrum disorder, substance use disorder, eating disorders as well as conduct problems. Whenever possibility, clinical interviews with patient from our department will be presented to the class. Research approaches in child and adolescent psychiatry will be introduced to the students including clinical trials, functional neuroimaging and transcranial sonography. Students will learn to critically evaluate the role of these techniques. Students will give presentation on the topics based on state-of-the-art textbooks and research articles.

Intended learning outcomes

Students who successfully completed this module will have acquired insights into neurodevelopmental aspects of child and adolescent psychiatric disorders including clinical symptoms, diagnostic criteria, etiology, pathophysiology and research approaches on ADHD, anxiety disorders, autism spectrum disorder, substance use disorder, eating disorders as well as oppositional defiant and conduct problems. Developmental aspects of neuropsychopharmacology are further discussed and the clinical use will be critically evaluated.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + S (0)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)

Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title	Abbreviation
Cellular Neurobiology	03-TN-CN-152-m01

Module coordinator	Module offered by
Institute of Clinical Neurobiology	Faculty of Medicine

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Students will get a theoretical introduction and amplification of topics in cellular neurobiology. The following topics will be discussed: structure, function, and molecular functional components of the peripheral nerves of the nervous system including its neuronal and non-neuronal cells as well as the neuromuscular endplate, motor behavioral tests in mouse models for motoneuron diseases; functional and morphological analysis of motoneurons and motor endplates, anatomical, cellular/neuronal plasticity at selected brain structures, e.g. hippocampus and cerebellum, molecular and cellular pathomechanisms of neuromotor disorders, optogenetic approaches and their use to understand circuit biology, immunohistochemistry /immunfluorescence in hippocampal/cerebellar slices, confocal microscopy, primary neuron preparations of dorsal root ganglia and hippocampal neurons, mouse perfusion, whole cell patch clamp recordings to determine ion channel properties.

Intended learning outcomes

Students who successfully completed this module are able to understand and dispose current experimental approaches in neurobiology. They are trained in preparations and recording techniques to study the function and pathomechanisms of neural model systems. The students are able to evaluate clinical aspects of neurobiology with a focus on the molecular, cellular and physiological mechanisms. Additionally, they are able to document, evaluate, and classify their own data that were collected during the lab course. Furthermore, the students can critically reflect their data in the context of the experimental methods used.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + P (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

b) Log (approx. 10 to 30 pages)

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Experimental Psychiatry			03-TN-EP-152-m01
Module coordinator			**Module offered by**
University Hospital, Department of Psychiatry, Psychosomatics and Psychotherapy, Molecular Psychiatry			Faculty of Medicine
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Brain regions and neurotransmitter systems involved in neuronal networks involved in experiencing anxiety and fear, attentional networks, learning and memory, and their importance for emotionality in humans, analysis of gene variants and their association with various psychiatric disorders and behavioural traits; animal models for psychiatric disorders, gene x environment interaction; neuroadaptive mechanisms as a result of stress exposure during different periods of lifetime; resilience, epistatic load hypothesis, mis match hypothesis, anatomical, cellular/neuronal plasticity at selected brain regions, e. g. hippocampus and amygdala; adult neurogenesis; immunohistochemistry/immunofluorescence using forebrain slices; neuronal reconstructions using the Neurolucida software.

Intended learning outcomes

Students who successfully completed this module will have acquired insights into current concepts and experimental approaches in psychiatry and especially in the neurobiological basis of the etiopathogenesis and the treatment of psychiatric disorders. They will have been trained in molecular biology methods, e. g. genotyping, gene expression analysis and in various methods studying structural neuronal plasticity of the brain. Additionally, they will have learned how to evaluate and present data in oral and written form that was collected during the lab course. In addition, the students will have learned to critically read scientific publications in the field of neurobiology/neuropsychiatry.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + P (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in
Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Developmental cognitive Neuroscience			03-TN-DCN-152-m01
Module coordinator			**Module offered by**
University Hospital, Department of Child and Adolescent Psychiatry, Psychosomatics and Psychotherapy			Faculty of Medicine
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will get an introduction to the key cognitive, behavioral and brain developmental steps. There will be strong focus on how the computational lens of reinforcement learning models, tightly linked to monoamine transmission and dopamine in particular, can useful to investigate research questions in developmental neuroscience. It will be discussed how developmental neuroscience can be a useful tool to investigate the development of psychiatric conditions, in particular ADHD and substance use problems. The methods focus will be on behavioral experiments, neuroimaging, in particular task-based fMRI, and computational modelling. Students will learn to critically evaluate the role of these techniques. Students will give presentation on the topics based on state-of-the-art research articles.

Intended learning outcomes

Students who successfully completed this module will have acquired insights into the current scientific state of normal and altered cognition and motivation as well as brain development. Developmental changes of basic cognition and motivation such as working memory, reinforcement learning and emotion processing will be addressed via behavioral and neuroscientific studies. Abnormal development will be explained in the context of the neuropsychiatric disorders such as attention-deficit / hyperactivity disorder, autism, substance use and anxiety / depression. The influences of main monoaminergic neuromodulators, in particular dopamine in the context of reinforcement learning, will be discussed.

Courses (type, number of weekly contact hours, language — if other than German)

V (0) + S (0) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in
Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
RNA-Metabolismus/ RNA metabolism			03-TN-RM-172-m01
Module coordinator		**Module offered by**	
Institute of Clinical Neurobiology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Each week a high-impact paper from the current literature that describes RNA-based mechanisms contributing to neurodegeneration is jointly analyzed in depth. Emphasis is placed on understanding of novel approaches for investigating RNA. The course organizer will give a short introduction at the beginning of each seminar describing the background for the paper to be discussed. Afterwards, students individually describe the original data and jointly discuss their relevance. Individual topics include: RNA expression, function and localization; RNA dysregulation in neurodegenerative diseases; high-throughput sequencing methods for transcriptome analysis; properties and functions of RNA-binding proteins.

Intended learning outcomes

After successful completion of this module, students will have gained a deeper understanding of current RNA-based research in the area of neurodegeneration. This outcome is achieved by a weekly in-depth analysis of a current article in this field. Students will become familiar with many techniques applied in RNA research and will learn how to critically interpret the results in the context of neurodegenerative diseases. By doing so, students will be able to evaluate methodological advances in RNA research and obtain a deeper understanding of the pathomechanisms underlying neurodegeneration. Through discussion and active participation, students will improve their communication and analysis skills.

Courses (type, number of weekly contact hours, language — if other than German)

S (0)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2017)

Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Electrophysiology in human and animals			06-TN-EPHY-182-m01
Module coordinator		**Module offered by**	
Department of Neurology, Department of Neurosurgery		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Besides a detailed theoretical introduction to the means of electrophysiological brain recording in human and animal models, this module will allow to apply analysis to these different types of data. It will focus on temporal analysis of electrophysiological signals but also on a frequency based analysis, i.e. oscillatory brain activity, which plays a crucial role in low-level as well as higher-level cognitive functions. Different electrophysiological responses to simple visual input will be compared between analysis approaches and data type.

Intended learning outcomes

This module will give a detailed theoretical and practical insight into different electrophysiological recording techniques and the resulting data obtained in human and animal brain recordings. Through hands-on analysis experience with such data, namely multi-electrode recordings, ECoG recordings and EEG/ MEG recordings, the module will allow students to learn analysis techniques and understand the information content of these different kinds of electrophysiological data. The recording and analysis methods introduced can build a bridge from spikes to the local field, from human to the animal model, from invasive to non-invasive approaches and will therefore stimulate translational thinking.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (30 to 60 minutes) or
e) presentation (20 to 45 minutes) or
f) poster according to specific congress requirements
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)

Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title	Abbreviation
Optical methods for visualization and manipulation of neural circuits- from synapses to behavior	03-TNOM-191-m01

Module coordinator	Module offered by
Institute of Clinical Neurobiology	Faculty of Medicine

ECTS	Method of grading	Only after succ. compl. of module(s)
5	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Students will get a theoretical introduction in light microcopy methods in neurobiology and systems neuroscience. Main topics are: Physics of light, building of a standard microscope, objectives, numeric aperture, bright field, phase contrast, fluorescence microscopy, confocal microscopy, resolution, contrast, Airy disc patterns, fluorescent molecules and dyes, image processing, preparation of images for publication, Software: GIMP and Fiji (ImageJ), imaging of calcium ions, genetically encoded calcium indicators (GCamp), viral techniques, lentiviral vectors, MMLV-based vectors, AAV, rabies virus, new developments in image analysis, deep learning, principles of circuit neuroscience, optogenetics, video-based behavioral analysis.

Intended learning outcomes

Students who successfully completed this module will have acquired distinct knowledge about light & fluorescence microscopy, in vivo calcium imaging and optogenetic methods in neuroscientific research. Processes of image acquisition, image preparation and image analysis will be introduced. Thus, students will be able to better understand, design and evaluate experiments based on microscopy and modern optical methods in the neurosciences. In short lab visits, the students will learn about principle components of microscopes (e.g. epifluorescence, confocal). The students will learn how these components are used to get better microscopy data. The students will see how molecular tools (e.g. viral vectors) and modern methods (optogenetics, chemogenetics) are used to better understand the anatomy and function of neurons and neural networks. They will acquire the competence to better understand these kind of experiments, to analyse and evaluate them. They will also be able to evaluate methods of systems neuroscience and will be able to theoretically design representative technical approaches. Short student presentations (3 – 4 min) will mediate specific presentation competence with the aim to allow presentation of complex microscopy methods in a focused and understandable way for a heterogeneous expert audience. The overall aim is that students will be able to understand, question, evaluate, recapituale and present light microscopy approaches in neurobiology and system neuroscience.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) Written Examination (30 to 60 minutes; also multiple choice) or
b) Protocol (10 to 30 pages) or
c) Oral examination of one candidate each (30 to 60 minutes) or
d) Oral Examination in groups of up to three students (30 to 60 minutes) or
e) Presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Master's degree (1 major) Translational Neuroscience (2018) Supplementary course Translational Neuroscience (2018) Master's degree (1 major) Translational Neuroscience (2022) Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Project design			03-TN-PDES-182-m01
Module coordinator		**Module offered by**	
Institute of Clinical Neurobiology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will get a theoretical introduction and amplification of how to write a Master Thesis. The following topics will be discussed: Official Regulations, Planing of a scientific project, Data production, Data evaluation, statistics, scientific writing, reading and citing literature. Using student former lab rotations a "dummy"-Master-Theisis is written, by each student and learned content is recessed.

Intended learning outcomes

Students who successfully completed this module are able to remind and understand important aspects of a preparing and writing a Master Thesis. Furthermore, students are able to classify important aspects in terms of planning scientific projects and of scientific writing. Based on current experimental data evaluation, students are able to critical read and evaluate current publications in neurobiology as well as extract relevant information from recent publications.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (30 to 60 minutes) or
e) presentation (20 to 45 minutes) or
f) poster according to specific congress requirements
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Project Development			03-TN-PDEV-182-m01
Module coordinator		**Module offered by**	
Institute of Clinical Neurobiology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will get a theoretical introduction and amplification of how to write a scientific Grant application. The following topics will be discussed: Planing of a scientific project, Data production, Data evaluation, , scientific writing, reading literature. Using student former lab rotations a "dummy"-Grant Application is written, by each student and learned content is recessed.

Intended learning outcomes

Students who successfully completed this module are able to remind and understand important aspects of how to invent a scientific project and how to write a grand application. Furthermore, students are able to classify important aspects in terms of preparing, planning and structuring a scientific project. Based on current knowledge and experimental data evaluation, students are able to critical read and evaluate current publications in neurobiology as well as extract relevant information from recent publications.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (30 to 60 minutes) or
e) presentation (20 to 45 minutes) or
f) poster according to specific congress requirements
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Ask the expert 1			03-TN-EXP1-182-m01
Module coordinator		**Module offered by**	
programme speaker		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Cutting edge topics in neurosciences, content varies each semester.

Intended learning outcomes

Students gain a deeper insight into the research work of invited scientists. The guest lecturers are selected in the subjects of psychology, psychiatry, neurobiology and neurology (priorities of the compulsory subjects).

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (30 to 60 minutes) or
e) presentation (20 to 45 minutes) or
f) poster according to specific congress requirements
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Ask the expert 2			03-EXP2-182-m01
Module coordinator		**Module offered by**	
programme speaker		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Cutting edge topics in neurosciences, content varies each semester.

Intended learning outcomes

Students gain a deeper insight into the research work of invited scientists. The guest lecturers are selected in the subjects of psychology, psychiatry, neurobiology and neurology (priorities of the compulsory subjects).

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (30 to 60 minutes) or
e) presentation (20 to 45 minutes) or
f) poster according to specific congress requirements
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Advanced Subject Lecture 1 (actual lectures to be specified)			03-TN-ASL-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1-2 semester	graduate	Please consult with course advisory service in advance.	

Contents

Cutting edge topics in neurosciences, content varies each semester.

Intended learning outcomes

Students gain an overview of current topics in neurosciences.

Courses (type, number of weekly contact hours, language — if other than German)

V (4)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Advanced Subject Lecture 2 (actual lectures to be specified)			03-TN-ASL-2-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1-2 semester	graduate	Please consult with course advisory service in advance.	

Contents

Cutting edge topics in neurosciences, content varies each semester.

Intended learning outcomes

Students gain an overview of current topics in neurosciences.

Courses (type, number of weekly contact hours, language — if other than German)

V (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) oral examination of one candidate each (30 to 60 minutes) or
c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Advanced Subject Lecture 3 (actual lectures to be specified)			03-TN-ASL-3-152-m01
Module coordinator			**Module offered by**
programme coordinator			Faculty of Medicine
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1-2 semester	graduate	Please consult with course advisory service in advance.	

Contents

Cutting edge topics in neurosciences, content varies each semester.

Intended learning outcomes

Students gain an overview of current topics in neurosciences.

Courses (type, number of weekly contact hours, language — if other than German)

V (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) oral examination of one candidate each (30 to 60 minutes) or
c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Meeting Participation 1 (Poster)			03-TN-MP-1-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Design and presentation of a poster with description of the research results of a project.

Intended learning outcomes

Poster design and oral presentation of scientific results, ability to answer specific questions in the context of the research project with a special regard to experimental design and interpretation of data.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

f) poster in accordance with conference specifications
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Meeting Participation 1 (Talk)			03-TN-MT-1-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Design and presentation of a talk with description of the research results of a project.

Intended learning outcomes

Talk design and oral presentation of scientific results, ability to answer specific questions in the context of the research project with a special regard to experimental design and interpretation of data.

Courses (type, number of weekly contact hours, language — if other than German)

S (4)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Advanced Training Program GSLS 1			03-TN-ATP-1-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Transferable skills tutorials: scientific writing and presentation skills.

Intended learning outcomes

Students have developed fundamental scientific writing and presentation skills.

Courses (type, number of weekly contact hours, language — if other than German)

T (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Advanced Training Program GSLS 2			03-TN-ATP-2-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Transferable skills tutorials: patent law, validation of enormous amounts of imaging data using special software.

Intended learning outcomes

Students are familiar with the fundamental principles of patent law and special software.

Courses (type, number of weekly contact hours, language — if other than German)

T (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Tutorial 1			03-TN-TU-1-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students work as tutors. They support teaching and are involved in the organisation and planning of lectures, seminars and practical courses.

Intended learning outcomes

Tutors will learn how to convey complex topics and to independently supervise a group of students. In addition, they will learn to organise and plan their own projects and to teach the contents to students.

Courses (type, number of weekly contact hours, language — if other than German)

T (1)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

90 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Tutorial 2			03-TN-TU-2-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students work as tutors. They support teaching and are involved in the organisation and planning of lectures, seminars and practical courses.

Intended learning outcomes

Tutors will learn how to convey complex topics and to independently supervise a group of students. In addition, they will learn to organise and plan their own projects and to teach the contents to students.

Courses (type, number of weekly contact hours, language — if other than German)

T (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module Group Compulsory Electives Lab Courses

(ECTS credits)

Module title			Abbreviation
Advanced lab rotation 2			03-TN-LR2-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service in advance.	

Contents

Students spend 4 weeks working under supervision on a small, well-defined scientific lab project.

Intended learning outcomes

Students have reinforced previously acquired lab skills, acquired new lab techniques and learned how to apply theoretical knowledge in the lab. Students have gained expertise in the analysis and presentation of raw data.

Courses (type, number of weekly contact hours, language — if other than German)

P (4)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

b) log (approx. 10 to 30 pages) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Advanced lab rotation 3			03-TN-LR3-152-m01

Module coordinator	Module offered by
programme coordinator	Faculty of Medicine

ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	Please consult with course advisory service in advance.

Contents

Students spend 6 weeks independently working on their own small, well-defined scientific lab project.

Intended learning outcomes

Students have reinforced previously acquired lab skills, acquired new lab techniques and learned how to apply theoretical knowledge in the lab. Students have gained expertise in the analysis and presentation of raw data.

Courses (type, number of weekly contact hours, language — if other than German)

P (4)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

b) log (approx. 10 to 30 pages) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
External Lab Rotation 1			03-TN-EL-1-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Research experience abroad in agencies, institutes or industry. Topics will vary according to the individual place selected for a placement.

Intended learning outcomes

Students are familiar with the structures of institutes and the industry abroad and acquire abilities that qualify them for a career in science.

Courses (type, number of weekly contact hours, language — if other than German)

P (4)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module title			Abbreviation
Advanced Practical Course Neuroscience Lab 1			03-TN-AL-1-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students independently work on a well-defined scientific lab project.

Intended learning outcomes

Students have reinforced previously acquired lab skills, acquired new lab techniques and learned how to apply theoretical knowledge in the lab. Students have gained expertise in writing lab reports and know how to give presentations about scientific data.

Courses (type, number of weekly contact hours, language — if other than German)

P (4)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)

Module Group Sections of Graduate School GSLS: Neuroscience

(ECTS credits)

Module title			Abbreviation
Research Group Seminar Neurosciences 1			07-MLSRG-NS1-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Current progress in the research group: presentation and discussion of the results of all research group members, exchange of experiences, troubleshooting tips.

Intended learning outcomes

Students have developed problem solving skills, presentation skills, scientific discussion skills as well as troubleshooting skills and are able to plan experiments.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) FOKUS Life Sciences (2015)
Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Module title			Abbreviation
Research Group Seminar Neurosciences 2			07-MLSRG-NS2-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Presentation and discussion of cutting edge literature.

Intended learning outcomes

Overview of cutting edge literature in the field of neuroscience, ability to critically read, present and discuss the content of publications.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Module title			Abbreviation
Graduate Program Seminar Neurosciences 1			07-MLSGP-NS1-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Invited guest speakers present and discuss cutting edge research including novel/current methods as well as fundamental research with relevance to the current programme/topics of the research group.

Intended learning outcomes

Students acquire an overview of cutting edge research in their field as well as an understanding of new and current methods.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) FOKUS Life Sciences (2015)
Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Module title			Abbreviation
Graduate Program Seminar Neurosciences 2			07-MLSGP-NS2-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Invited guest speakers present and discuss cutting edge research including novel/current methods as well as fundamental research with relevance to the current programme/topics of the research group.

Intended learning outcomes

Students acquire an overview of cutting edge research in their field as well as an understanding of new and current methods.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Module title			Abbreviation
Workshop Neurosciences 1			07-MLSWS-NS1-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Discussion of current methods and techniques required in lab projects. Insights into and training in novel methods.

Intended learning outcomes

Students acquire proficiency in those methods and techniques that are required in their lab projects.

Courses (type, number of weekly contact hours, language — if other than German)

W (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)
Students will be informed about the method, length and scope of the assessment prior to the course.
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) FOKUS Life Sciences (2015)
Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Module title			Abbreviation
Workshop Neurosciences 2			07-MLSWS-NS2-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Discussion of current methods and techniques required in lab projects. Insights into and training in novel methods.

Intended learning outcomes

Students acquire proficiency in those methods and techniques that are required in their lab projects.

Courses (type, number of weekly contact hours, language — if other than German)

W (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (30 to 60 minutes, including multiple choice questions) or
b) log (approx. 10 to 30 pages) or
c) oral examination of one candidate each (30 to 60 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or
e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Module title			Abbreviation
Retreat Neurosciences 1			07-MLSRNS1-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Presentation of current research project results in the form of a poster and/or talk. Critical evaluation of results and their discussion in the research community. Discussion and evaluation of interim progress reports with supervisors/examination committee and troubleshooting.

Intended learning outcomes

Poster design skills, (oral) presentation skills, ability to critically discuss results taking into consideration current literature in the field, troubleshooting skills, evaluation of interim progress reports.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) FOKUS Life Sciences (2015)
Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Module title			Abbreviation
Retreat Neurosciences 2			07-MLSRNS2-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Presentation of current research project results in the form of a poster and/or talk. Critical evaluation of results and their discussion in the research community. Discussion and evaluation of interim progress reports with supervisors/examination committee and troubleshooting.

Intended learning outcomes

Poster design skills, (oral) presentation skills, ability to critically discuss results taking into consideration current literature in the field, troubleshooting skills, evaluation of interim progress reports.

Courses (type, number of weekly contact hours, language — if other than German)

S (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Thesis

(30 ECTS credits)

Module title			Abbreviation
Masterthesis in Translational Neuroscience			03-TN-MST-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
25	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The investigation of a current scientific topic using modern methods and technologies. The documentation of the research results in a written thesis, and an oral examination.

Intended learning outcomes

Students are able to independently plan and execute a scientific research project. They are able to collect, present and interpret raw data according to international standards of good scientific conduct. They are able to summarise their data in a written paper according to scientific rules and standards. Students are able to critically discuss and defend their experiment plan, results and interpretations in the context of current publications in their field. They have acquired a broad expertise in their field of study as well as in related fields.

Courses (type, number of weekly contact hours, language — if other than German)

No courses assigned to module

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Master's thesis (50 to 100 pages)
Language of assessment: English

Allocation of places

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Additional information

Time to complete: 6 months.

Workload

750 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)

Module title			Abbreviation
Oral Examination Translational Neuroscience			03-TN-MSK-152-m01
Module coordinator		**Module offered by**	
programme coordinator		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	03-TN-MST	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The investigation of a current scientific topic using modern methods and technologies. The documentation of the research results in a written thesis, and an oral examination.

Intended learning outcomes

Students are able to independently plan and execute a scientific research project. They are able to collect, present and interpret raw data according to international standards of good scientific conduct. They are able to summarise their data in a written paper according to scientific rules and standards. Students are able to critically discuss and defend their experiment plan, results and interpretations in the context of current publications in their field. They have acquired a broad expertise in their field of study as well as in related fields.

Courses (type, number of weekly contact hours, language — if other than German)

K (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

presentation of Master's thesis (30 minutes) and discussion (15 minutes)
Language of assessment: Upon agreement of both examiners, assessment may also be held in English or another language.

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Translational Neuroscience (2015)
Master's degree (1 major) Translational Neuroscience (2017)
Master's degree (1 major) Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)