Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Subdivided Module Catalogue

for the Subject

Translational Medicine

as a Master's with 1 major

with the degree "Master of Science"

(90 ECTS credits)

Examination regulations version: 2018
Responsible: Faculty of Medicine

Learning Outcomes

German contents and learning outcome available but not translated yet.
Die Medizinische Fakultät der Universität Würzburg bietet als Ergänzung und Erweiterung des Studiums der Humanmedizin bzw. Zahnmedizin das Masterstudium „Translational Medicine" an.

Das Studium wird überwiegend forschungsorientiert durchgeführt und vertieft das Verständnis der einzelnen Phasen der Translation von den naturwissenschaftlichen Grundlagen über präklinische Forschung und klinischen Studien bis hin zur Implementierung neuer Erkenntnisse in der medizinischen Versorgung.

Das Masterstudium richtet sich an besonders leistungsfähige und leistungsbereite Absolvent:innen der Humanmedizin bzw. Zahnmedizin, die hiermit Qualifikationen für Führungspositionen in der akademischen Medizin, aber auch der Wirtschaft erlangen.

Wissenschaftliche Befähigung

- Die Absolvent:innen verfügen über ein kritisches Verständnis der naturwissenschaftlichen Grundlagen der Medizin und ihrer Anwendung auf die einzelnen Disziplinen der theoretischen Medizin.
- Die Absolvent:innen erhalten Einblick in die Methoden und Vorgehensweisen der aktuellen experimentellen biomedizinischen Forschung. Darüber hinaus erwerben sie grundlegende Kenntnisse der modernen klinischen und klinisch epidemiologischen Forschung.
- Die Absolvent:innen verstehen die methodische Grundlagen der Planung und Durchführung patientenorientierter Studien. Zudem besitzen sie vertiefte Fähigkeiten und Fertigkeiten zur Analyse klinischer und epidemiologischer Daten.
- Die Absolvent:innen erlangen einen Überblick über aktuelle Fragestellungen und Konzepte im Bereich Translational Medicine, die sie anhand einzelner Beispiele praktisch und theoretisch vertieft haben.
- Die Absolvent:innen haben erste Erfahrungen in der kritischen Analyse wissenschaftlicher Publikationen gesammelt und sie können Qualitätskriterien erfassen.
- Die Absolvent:innen können ihr neu erworbenes Wissen und die analytischen und praktischen Fähigkeiten im Rahmen einer umschriebenen Forschungsfrage anwenden.

Befähigung zur Aufnahme einer Erwerbstätigkeit

- Die Absolvent:innen sind in der Lage ihr fundiertes theoretisches Wissen im Rahmen von neuen medizinischen Forschungsprojekten konstruktiv und zielführend einzubringen.
- Die Absolvent:innen können den aktuellen Wissensstand medizinischer Disziplinen kritisch hinterfragen und in gemischten Teams an der wissenschaftsbasierten Weiterentwicklung mitarbeiten.

Persönlichkeitsentwicklung

- Die Absolvent:innen können eigenverantwortlich Angebote für ihre eigene Weiterqualifizierung strukturieren und für die Erreichung ihrer beruflichen Ziele effektiv zusammenstellen.
- Die Absolvent:innen erwerben durch eigenständige Planung und Umsetzung ihrer Forschungspraktika und die Mitarbeit bei der Organisation von Veranstaltungen hohe Kommunikationskompetenzen und Teamfähigkeit.

Befähigung zum gesellschaftlichen Engagement

- Die Absolvent:innen besitzen die Fähigkeit komplexe Zusammenhänge zu strukturieren und in ihren gesellschaftlichen Auswirkungen einzuschätzen.
- Die Absolvent:innen können ihre erworbenen Kompetenzen für die Allgemeinheit nutzbringend anwenden und ihre Arbeit nach ethischen Grundsätzen und verantwortungsbewusst gestalten.

- Die Absolvent:innen stärken ihre Fähigkeiten zum ehrenamtliches Engagement durch die Verknüpfung von gesellschaftlichen Engagement mit fachlichem Lernen.

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)):

21-Nov-2018 (2018-62)

11-Dec-2024 (2024-109)

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.

The subject is divided into

Abbreviation	Module title	ECTS credits	Method of grading	page
Compulsory Courses (25 ECTS credits)				
03-TM-EEM-181-m01	Introduction to Experimental Medicine: from the Molecular Basis to Translational Leads	5	NUM	26
03-TM-EKFE-181-m01	Introduction to Clinical Research / Epidemiology: from Clinical Studies to Implementation in the Population	5	NUM	27
03-TM-FP1-181-m01	Research Internship I	5	NUM	29
03-TM-FP2-181-m01	Research Internship II	10	NUM	30
Compulsory Electives I: Translational Medicine (25 ECTS credits)				
03-TM-METH-181-m01	Experimental Methods Course	5	NUM	40
03-98-MVKB-152-m01	Cardiovascular Biology	5	NUM	12
03-98-MVMO-152-m01	Molecular Oncology	5	NUM	14
03-TM-INFIMM-181-m01	Infection and Immunity	5	NUM	35
03-TN-NB1-152-m01	Clinical Neurobiology 1	5	NUM	49
03-TM-IGM-181-m01	Individualized / Genetic Medicine	5	NUM	34
03-98-MVSZ-152-m01	Stem Cell Biology	5	NUM	16
03-98-MVTF-152-m01	Tissue Engineering / Functional Materials	5	NUM	18
03-TM-BIOM-181-m01	Biometric Methods	5	NUM	22
03-TM-KLST-181-m01	Clinical Studies (GCP, AMG, MPG)	5	NUM	38
03-TM-BIO3-181-m01	Biobanking, Biomarkers and Bioinformatics	5	NUM	21
03-TM-KEPI-181-m01	Disease-Specific Epidemiology	5	NUM	37
03-TM-EPIMETH-181-m01	Epidemiologic Methods	5	NUM	28
03-TM-EBM-181-m01	Evidence-Based Medicine	5	NUM	25
03-TM-PROG-DIAG-181-m01	Prognostic and Diagnostic Studies	5	NUM	42
03-TM-MEDINF-181-m01	Medical Informatics	5	NUM	39
03-TM-GLGH-181-m01	Global Health	5	NUM	32
03-TM-VVER-181-m01	Selected Courses from Related Study Programs	5	NUM	47
03-TM-AIMed-242-m01	Medical AI Applications	5	NUM	20
Compulsory Electives II: Professional advancement (10 ECTS credits)				
03-TM-FSEM-181-m01	Integrated Research Seminar	2	B/NB	31
03-TM-JCL-181-m01	Journal Club	2	B/NB	36
03-TM-WSCH-181-m01	Winter School	2	B/NB	48
03-98-FSQ-GEN-152-m01	Genetic Engineering and Biosafety	1	B/NB	8
03-98-FSQ-VTK2-152-m01	Laboratory Animal Sciences 2	3	B/NB	10
03-TM-BSTAT-181-m01	Biostatistics	2	B/NB	23
03-TM-GSP-181-m01	Responsible Conduct of Research	2	B/NB	33
03-TM-PRES-181-m01	Scientific Writing and Presentation	2	B/NB	41
03-TM-SERV-181-m01	Service Learning: Community Engagement	2	B/NB	44
00-GSIK-IKK-M-172-m01	Global Systems and Intercultural Competence	2	B/NB	7
03-TM-VAND-181-m01	Selected Courses from other Faculties	2	B/NB	46
Thesis (30 ECTS credits)				
03-TM-THESIS-182-m01	Master Thesis	25	NUM	45

03-TM-COLL-182-m01	Colloquium	5	NUM	24

Module title			Abbreviation
Global Systems and Intercultural Competence			00-GSIK-IKK-M-172-m01
Module coordinator		**Module offered by**	
holder of the Chair of Systematic Educational Science		Service Centre for Innovation in Teaching and Learning (ZiLS)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Basic knowledge and concepts of interculturality and intercultural phenomena, examples of intercultural phenomena

Intended learning outcomes

Sensitization to intercultural and global phenomena, enhancement of intercultural competences

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 can be chosen to earn a bonus)

a) presentation (approx. 15 to 30 minutes) or
b) term paper (approx. 5 to 10 pages) or
c) written examination (approx. 30 minutes) or
d) portfolio (approx. 10 hours) or
e) oral examination (approx. 15 minutes)
Type and length/scope of assessment to be specified at the beginning of the course.

Allocation of places

30 places. Places will be allocated after review of written applications (CV, letter of motivation, essay) and (group) interviews. Should there be more than 14 equally qualified applicants, places will be allocated according to the number of subject semesters. Lottery. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Workload

60 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

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

Module title			Abbreviation
Genetic Engineering and Biosafety			03-98-FSQ-GEN-152-m01
Module coordinator		**Module offered by**	
Institute of Molecular Infection Biology and Graduate School of Life Sciences		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
1	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The lecture imparts knowledge in the following sub-areas:
1) Theoretical fundamentals of genetic engineering and genetic engineering safety requirements as well as an overview of the areas of application of genetic engineering. Introduction to the legal framework and regulations that must be observed when handling biomaterials, genetically modified organisms and pathogens.
2) Learn and reflect
- principles of good scientific practice
- genesis and worldwide establishment of principles
- individual people, (societal) groups and institutions involved, their roles and interests
- specific regulations and procedures of dealing with misconduct, especially those of JMU

Intended learning outcomes

Ad 1) The students have knowledge of methods of genetic engineering as well as the relevant regulations of the Infection Protection Act and the Genetic Engineering Safety and Biological Substances Ordinance. They can categorize biomedical work with regard to its hazard potential. The students remember safety-relevant rules of conduct in the laboratory and are able to apply them in practice.
Ad 2) Factual competencies: Knowledge of rules, knowledge of the current discussion on GSP worldwide
Self-competencies: Ability to understand GSP as a process in science and starting point to develop one's own awareness of and attitude towards GSP.

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

V (1)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (45 to 90 minutes) or
b) log (10 to 20 pages) or
c) oral examination of one candidate each (20 to 30 minutes) or
d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or
e) presentation (20 to 30 minutes)
Students will be informed about the type and length of assessment at the beginning of the course.

Allocation of places

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Additional information

Students MUST take this module.

Workload

30 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

Bachelor's degree (1 major) Biomedicine (2015)
Master's degree (1 major) Experimental medicine (2015)
Supplementary course Translational Medicine (2018)
Bachelor's degree (1 major) Biomedicine (2018)
Master's degree (1 major) Translational Medicine (2018)

Module title	Abbreviation
Laboratory Animal Sciences 2	03-98-FSQ-VTK2-152-m01

Module coordinator	Module offered by
holder of the Chair of Experimental Biomedicine and Animal Welfare Officer of the University of Würzburg	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	undergraduate	--

Contents

According to the Animal Welfare Regulation Govering Experimental Animals (TierSchVersV), animal experiments on vertebrates and cephalopods may only be carried out by persons who possess the required knowledge and skills. This means that both theoretical and practical expertise must be acquired.
In the lecture Animal Welfare and Laboratory Animal Science, the theoretical knowledge is taught, which is listed in Annex 1 Chapter 3 TierSchVersV.
In terms of content, the module is based on EU Directive 2010/63 for acquiring expertise in animal welfare (formerly FELASA Cat. B). Based on the background of the specific biology, anatomy and physiology of the animal species mouse, optionally also of the rat, which are recapitulated in the module in an application-oriented manner, the students* learn and practice exemplary essential animal experimental techniques with a focus on keeping and handling the animals, administration of substances, sampling of biological probes, anesthesia and analgesia through to surgical interventions and the painless and low-stress euthanasia of animals. In addition to the methodological and experimental principles, the module also focuses on acquiring in-depth knowledge of the german animal protection law and the TSchVersVO as well as the ability for an ethical consideration of animal experiments in the area of conflict between animal protection and medical-translational research.

Intended learning outcomes

Students acquire the expertise for the theoretical part for conducting animal experiments, which is certified by passing the exam. Raising awareness of ethical issues related to the relationship between humans and animals, intrinsic value of life, and arguments for and against the use of animals for scientific purposes.
The formal objective is the acquisition of animal welfare expertise based on the EU directive in consultation with the local authorities. The course enables you to handle laboratory animals in an animal welfare-friendly manner, conveys core competencies in animal experiments, taking into account the complexity of the entire organism, and methodological requirements for planning and conducting your own animal experiments. It teaches the legal animal welfare principles for applying for your own experimental projects. A special concern is the raising of awareness for the respect of the experimental model as a pain-sensitive living being while maintaining objective experimental principles.

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

V (2) + P (1)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 90 minutes)

Allocation of places

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Additional information

Equivalent to animal welfare qualification (GV-SOLAS (Society of Laboratory Animals) / FELASA category B).

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
Bachelor's degree (1 major) Biomedicine (2015) Master's degree (1 major) Experimental medicine (2015) Supplementary course Translational Medicine (2018) Bachelor's degree (1 major) Biomedicine (2018) Master's degree (1 major) Translational Medicine (2018) Bachelor's degree (1 major) Biomedicine (2020)

Module title			Abbreviation
Cardiovascular Biology			03-98-MVKB-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Experimental Biomedicine		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

Becoming familiar with the basics of the cardiovascular system by means of a lecture series. The first section comprises the anatomical, physiological and biochemical basis. In the second section these fundamentals will be deepened based on relevant cardiovascular diseases of platelets, the vasculature and the heart. In the context of these disorders, current and future targets for adequate therapies will be discussed.

Intended learning outcomes

Students have developed the ability to understand the molecular and physiological basics relevant for cardiovascular biology, with the focus on developmental biology, platelets and coagulation. These will be exemplified by stroke, myocardial disorders, metabolic syndrome, vasculitides and genetic causes. After attending the lecture series, students will be able to understand, describe and assign pathological and pathophysiological changes affecting the cardiovascular system.

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

V (2)
Module taught in: German/English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (30 to 60 minutes) or
b) log (approx. 10 to 20 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: German or English
Assessment offered: Once a year, winter semester

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) Biochemistry (2015)
Master's degree (1 major) Biomedicine (2015)
Master's degree (1 major) Experimental medicine (2015)
Master's degree (1 major) Biochemistry (2017)
Supplementary course Translational Medicine (2018)

Master's degree (1 major) Biomedicine (2018)
Master's degree (1 major) Translational Medicine (2018)
Master's degree (1 major) Biochemistry (2019)

Module title			Abbreviation
Molecular Oncology			03-98-MVMO-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biochemistry and Molecular Biology			
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Molecular mechanisms of tumourigenesis; experimental dissection of tumours; metabolic reprogramming in cancer; visualising in vivo tumour progression and response to therapy; targeting Myc for tumour therapy; Wnt signalling and colorectal cancer; cell cycle and tumour suppressor genes; protein turnover in normal and cancer cells; molecular mechanisms of melanoma development; tumour immunology; stem cells and epigenetics; signal transduction and personalised cancer therapy; molecular pathology; infections and tumour development.

Intended learning outcomes

Students understand the current topics and challenges in tumour research and the methods used to address such challenges.

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

V (2)
Module taught in: German/English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (30 to 60 minutes) or
b) log (approx. 10 to 20 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: German or English
Assessment offered: Once a year, winter semester

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) Biochemistry (2015)
Master's degree (1 major) Biomedicine (2015)
Master's degree (1 major) Experimental medicine (2015)
Master's degree (1 major) Biochemistry (2017)
Supplementary course Translational Medicine (2018)
Master's degree (1 major) Biomedicine (2018)
Master's degree (1 major) Translational Medicine (2018)

Master's degree (1 major) Biochemistry (2019)

Module title			Abbreviation
Stem Cell Biology			03-98-MVSZ-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Developmental Biochemistry		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

In this module, selected current problems from the fields of stem cell biology, cellular differentiation and regenerative medicine are used to provide basic knowledge as well as analytical approaches. The current state of research is considered on the basis of the historical context. Selected examples are used to learn about topic-specific contexts. Special emphasis is placed on the methodology used to study and characterize stem cells at the molecular level in vivo and in vitro. Bioethical and legal frameworks are discussed in the course of the lecture.

Intended learning outcomes

Necessary basic knowledge to work on, analyze and critically interpret questions from stem cell biology, cellular differentiation and regenerative medicine on the basis of current literature. A basic methodological competence for independent scientific work in the field of stem cell biology. Development of an ethical awareness in relation to the application of stem cells in biomedicine.

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

V (2)
Module taught in: German/English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (30 to 60 minutes) or
b) log (approx. 10 to 20 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: German or English
Assessment offered: Once a year, summer semester

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) Biochemistry (2015)
Master's degree (1 major) Biomedicine (2015)
Master's degree (1 major) Experimental medicine (2015)
Master's degree (1 major) Biochemistry (2017)
Supplementary course Translational Medicine (2018)

Master's degree (1 major) Biomedicine (2018)
Master's degree (1 major) Translational Medicine (2018)
Master's degree (1 major) Biochemistry (2019)

Module title	Abbreviation
Tissue Engineering / Functional Materials	03-98-MVTF-152-m01

Module coordinator	Module offered by
holder of the Chair of Tissue Engineering and Regenerative Medicine	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

Cell culture technology, basics of tissue engineering, test systems as an alternative to animal experiments skin, intestine, lung, trachea, blood-brain barrier, tumors and other diseases. The development of cell-based transplants is discussed, as well as the regulatory basis for the approval of these and of medical devices and drugs. In detail, these are REACH (Registration, Evaluation, Restriction and Authorization of Chemicals), the Medical Devices and Drugs Act, GLP (Good Laboratory Practice), GMP (Good Manufacturing Practice) and GCP (Good Clinical Practice).

Intended learning outcomes

The student has expertise in tissue engineering, regenerative medicine, bioprocess engineering, test systems and basic relationships in the field of cell biology, metabolism, differentiation, adhesion to surfaces and mechanobiology. The student has methodological competence in quality management. The contents taught in the course lead to a deeper understanding of these competence fields and enable the application, which allows an independent assessment by analyzing publications or questions. For this purpose, the student should be able to understand a scientific publication in this field, to acquire additional background knowledge independently and, after analyzing the experimental results, to evaluate and discuss them critically.

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

V (2)
Module taught in: German/English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (30 to 60 minutes) or
b) log (approx. 10 to 20 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: German or English
Assessment offered: Once a year, winter semester

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) Biochemistry (2015)
Master's degree (1 major) Biomedicine (2015)
Master's degree (1 major) Experimental medicine (2015)
Master's degree (1 major) Biochemistry (2017)
Supplementary course Translational Medicine (2018)
Master's degree (1 major) Biomedicine (2018)
Master's degree (1 major) Translational Medicine (2018)
Master's degree (1 major) Biochemistry (2019)

Module title	Abbreviation
Medical AI Applications	03-TM-AIMed-242-m01

Module coordinator	Module offered by
Institute of Clinical Epidemiology and Biometry (ICE-B), holder of the Professorship for Medical informatics	Institute of Clinical Epidemiology and Biometry (ICE-B)

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The module provides a comprehensive insight into the application of AI in medicine. It covers a wide range of topics and initially focuses on fundamental knowledge that is crucial for understanding the role of AI in healthcare, such as healthcare systems and ethics. In addition, specific applications of machine learning in the analysis of medical data will be discussed. Examples of projects at the University Hospital of Würzburg that use AI will be presented and analyzed. These examples will demonstrate the impact of AI on neuroimaging, neurology, psychiatry and its integration into clinical trials. To enhance learning and engagement, the course includes interactive Moodle quizzes with case studies on each topic covered.

Intended learning outcomes

The module "Artificial Intelligence in Medicine" aims to provide students with a solid understanding and practical insights into the application of AI in medical practice. Students develop professional competence by understanding the basic principles and applications of AI in medicine, including the evaluation and integration of these technologies into existing systems. They acquire methodological competence by learning to interpret clinical data and recognize the relevance of different data formats without engaging in programming or detailed data transformation. In addition, they develop social competence by discussing and reflecting on the ethical aspects of the use of AI and promote personal competence by fostering critical thinking and the ability to independently assess the effectiveness and safety of AI applications.

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

V (2) + Ü (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
Language of assessment: German and/or English
creditable for bonus

Allocation of places

50 (lot)

Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: winter semester

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

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Module appears in

Supplementary course Translational Medicine (2018)
Master's degree (1 major) Translational Medicine (2018)
Master's degree (1 major) Computer Science (2025)

Module title			Abbreviation
Biobanking, Biomarkers and Bioinformatics			03-TM-BIO3-181-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Translational Clinical Research / IBDW		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

Conception and purpose of biobanks; quality assurance; analysis of biomarkers; linking to existing (clinical) databases; ethical and data protection aspects; practical implementation and interaction with stakeholders / donors / public.

Intended learning outcomes

The students understand the concept of biobanking and its central challenges. They gain first insights into the practical use and analysis of biomaterials using different methods. They also know about the basic principles of the ethical and legal framework. They are aware of the importance of interactions with the various stakeholders.

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

V (1) + S (1)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) Oral examination (approx. 30 minutes) or
b) written examination (approx. 45 to 90 minutes)
Type and length/scope of assessment to be specified at the beginning of the course.
Language of assessment: German or 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

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

Module title			Abbreviation
Biometric Methods			03-TM-BIOM-181-m01
Module coordinator		**Module offered by**	
Institute of Clinical Epidemiology and Biometry (ICE-B)		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	May not be combined with 03-TM-BSTAT.	

Contents

Working with the statistical software SPSS; preparation of data; descriptive statistics; methods of inferential statistics; statistical modeling for quantitative, binary, ordinal and survival data.

Intended learning outcomes

The students are able to prepare data tables, import, export, merge, transform and recode data. They can describe data by numerical measures and present them graphically. They are familiar with tests of significance and confidence intervals and know the common basic methods of statistical analysis. The students perform multiple regression analyses with the general linear model, binary and ordinal logistic regression and Cox regression (including time-dependent covariates) and are able to check for statistical interaction. At the end of the course, the students perform analyses and create tables and figures for a scientific paper.

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

V (3) + S (1)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Belegarbeit (thesis)
Language of assessment: German or 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

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

Module title			Abbreviation
Biostatistics			03-TM-BSTAT-181-m01
Module coordinator		**Module offered by**	
Institute of Clinical Epidemiology and Biometry (ICE-B)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	May not be combined with 03-TM-BIOM.	

Contents

Working with the statistical software SPSS; preparation of data; descriptive statistics; common methods of statistical testing.

Intended learning outcomes

The students are able to prepare data tables, import, export, merge, transform and recode data. They can describe data by numerical measures and present them graphically. They are familiar with basic tests of significance.

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

V (0.5) + S (0.5)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

oral examination (approx. 30 minutes)
Language of assessment: German or English

Allocation of places

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Additional information

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Workload

60 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

Supplementary course Translational Medicine (2018)
Bachelor's degree (1 major) Biomedicine (2018)
Master's degree (1 major) Translational Medicine (2018)

Module title			Abbreviation
Colloquium			03-TM-COLL-182-m01
Module coordinator		**Module offered by**	
chairperson of examination committee		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 present the results of their thesis project in a scientific colloquium.

Intended learning outcomes

Students are able to present and defend the data from their thesis project in front of a professional audience.

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

A (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 can be chosen to earn a bonus)

colloquium (30 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 Medicine (2018)

Module title			Abbreviation
Evidence-Based Medicine			03-TM-EBM-181-m01
Module coordinator		**Module offered by**	
Institute of Clinical Epidemiology and Biometry (ICE-B)		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

Principles of evidence-based medicine; critical assessment of scientific publications; standards of reporting evidence; systematic reviews and meta-analyses; structure and objectives of clinical guidelines.

Intended learning outcomes

The students are able to critically review published papers with respect to methods, quality, arising evidence and limitations. They know the contemporary standards of reporting evidence from studies (CONSORT, STROBE etc.). Students are able to assess evidence from several sources. They are familiar with methods of systematic review of existing evidence and meta-analysis. They know methods how to test for inhomogeneity and publication bias and how to compute aggregated estimates. They have background knowledge about the development of clinical guidelines.

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

V (1.5) + S (1.5)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

oral examination (approx. 30 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Introduction to Experimental Medicine: from the Molecular Basis to Translational Leads			03-TM-EEM-181-m01
Module coordinator		**Module offered by**	
holder of the Chair of Developmental Biochemistry		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

From the molecular basis to translational leads: Molecular and cell biological methods, imaging modalities in research, overview of model systems such as mouse and zebrafish, case studies for translational research.

Intended learning outcomes

Students gain an overview of molecular and cell biology research methods as well as imaging modalities in research. They know important model systems in biomedical basic research. They can explain examples of the successful translation of results from basic research into clinical application.

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

V (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Introduction to Clinical Research / Epidemiology: from Clinical Studies to Implementation in the Population			03-TM-EKFE-181-m01
Module coordinator		**Module offered by**	
Institute of Clinical Epidemiology and Biometry (ICE-B)		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

From clinical studies to implementation in the population: Fundamentals of clinical and epidemiological research; basic concepts of diagnostics and their application; computation and interpretation of epidemiological measures.

Intended learning outcomes

The students have basic knowledge on questions of clinical research and epidemiology, on study designs and potential sources of, and measures against bias of study results. They have an overview on problems and methods of clinical research in different disease entities and know performance parameters of diagnostic tests and basic epidemiological risk measures.

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

V (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Epidemiologic Methods			03-TM-EPIMETH-181-m01
Module coordinator		**Module offered by**	
Institute of Clinical Epidemiology and Biometry (ICE-B)		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

Advanced aspects of study design; analysis of the relationship between risk factors and outcome; aims and methods of health care research; concept of health economy.

Intended learning outcomes

In further discussions of design aspects, the students learn how to purposefully use methodological elements to answer research questions and to assure the quality of study data. They perform numerical analyses to quantify the relationship between risk factor and outcome in the given study context and assess the evidence arising from the data. They are able to apply methods to avoid or eliminate confounding in study design and analysis. The students get to know aims and methods of health care research and study examples of common diseases (heart failure, stroke). They know basic concepts of health economy (cost assessment, quality and disability adjusted life time).

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

V (1.5) + S (1.5)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

oral examination (approx. 30 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Research Internship I			03-TM-FP1-181-m01
Module coordinator		**Module offered by**	
degree programme coordinator Translational Medicine		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	Prior approval from director of studiesr required.	

Contents

The content depends on the profile of the research group and can cover the following topics.
Experimental section: Visualization of molecular and cellular processes by molecular biological methods, in vivo imaging; Cell analysis; Use of high-throughput techniques and bioinformatic analyses of Omics data.
Clinical-epidemiological area: preparation of study materials; Implementation and testing of databases, Quality control / monitoring, Creation and supervision of standard operating procedures (SOPs) for clinical trials, Data collection (also on patients or subjects) in clinical and epidemiological studies.

Intended learning outcomes

Students can carry out selected methods of experimental and / or clinical research and apply them to defined questions. They are able to analyze and evaluate collected data sets. In the written paper, students show that they can summarize the relevant facts correctly and in a structured manner.

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

P (6)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Log (approx. 15 pages)
Language of assessment: English

Allocation of places

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Additional information

Additional information on module duration: 3 to 4 weeks, full time.

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

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

Module title			Abbreviation
Research Internship II			03-TM-FP2-181-m01
Module coordinator		**Module offered by**	
degree programme coordinator Translational Medicine		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	Prior approval from director of studiesr required.	

Contents

Participation in a research project or a clinical study. The content and methods depend on the selected work-group.

Intended learning outcomes

Students learn new methods and approaches of clinical and experimental research within the framework of a research project. They can apply these within the framework of the scientific question. Important competences are reproducible data collection, structured evaluation and the interpretation of new results. Students acquire the ability to record their own work according to professional standards and to communicate and discuss their results orally and in writing.

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

P (12)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

oral presentation (approx. 10 to 15 minutes) and log (approx. 20 to 30 pages)
Language of assessment: German or English

Allocation of places

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Additional information

Additional information on module duration: 6 to 8 weeks, full time.

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

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

Module title			Abbreviation
Integrated Research Seminar			03-TM-FSEM-181-m01
Module coordinator		**Module offered by**	
degree programme coordinator Translational Medicine		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students present their own work from research internships, master's theses or a medical doctorate and discuss it. The focus will be the interdisciplinary presentation, relevance for translational medicine and possible future implications. Alternating guests also give presentations on research topics in translational medicine.

Intended learning outcomes

Students can present their own scientific work to an audience and they can illustrate and discuss the results. They acquire basic knowledge of moderating an event.

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 can be chosen to earn a bonus)

presentation (approx. 30 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

60 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

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

Module title			Abbreviation
Global Health			03-TM-GLGH-181-m01
Module coordinator		**Module offered by**	
Klinikum Würzburg Mitte, Tropical Medicine Department		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

This module will introduce the students to the important aspects of Global Health based on examples in the following four thematic fields: 1) Global Burden of Disease 2) Determinants of Health 3) Intercultural Competence 4) Global Research/Evidence

Intended learning outcomes

At the end of the seminar, the participants will be able to determine the key aspects of Global Health, to analyze typical challenges and problems on selected examples and to describe their possible solutions. Furthermore they will be able to use the acquired skills of the "problem tree analysis" for scientific projects and integrate them in daily work processes.

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

S (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

presentation (approx. 15 to 30 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Responsible Conduct of Research			03-TM-GSP-181-m01
Module coordinator		**Module offered by**	
Graduate School of Life Sciences		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Principles of Good Scientific Practice, their development and worldwide implementation; Inividual stakeholders, (societal) groups and oirganizations involved, their roles, interests and specific regulations, in particular those of the University of Würzburg; Case studies.

Intended learning outcomes

Knowledge of the principles of good scientific practise and ability to put them into perspective, reflect on them and apply them.

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

S (1)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 30 minutes)
Language of assessment: German or English

Allocation of places

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Additional information

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Workload

60 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

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

Module title			Abbreviation
Individualized / Genetic Medicine			03-TM-IGM-181-m01
Module coordinator		**Module offered by**	
Comprehensive Cancer Center Mainfranken		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

Methodological and bioinformatic principles of high throughput methods for the analysis of tumors. Based on selected examples it will be illustrated how targeted and personalized therapies can be developed in oncology based on these novel technologies and how this will influence future developments in clinical research and patient care.

Intended learning outcomes

Students recognize the fundamental importance of genetics and modern Omics technologies for understanding the pathogenesis and course of cancer. They understand the translation of molecular changes into clinical reseach questions and individual treatment decisions.

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

V (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 30 to 60 minutes)
Language of assessment: German or 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

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

Module title	Abbreviation
Infection and Immunity	03-TM-INFIMM-181-m01

Module coordinator	Module offered by
holder of the Chair of Molecular Infection Biology and holder of the Chair of Medical Microbiology and Mycology	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

Relevant topics of translational research in microbiology and immunology will be introduced based on relevant examples like vaccine development, immunotherapy, RNA-base therapy, new antibiotics, probiotics, human microbiome, host niches, heterogeneity as well as resistance and new therapeutics.

Intended learning outcomes

Students will get an overview on the development of new diagnostics and therapeutics in infectious diseases and basic insight into standardised steps in the approval of new tools for clinical application. They can assess the use of modern technologies, including high throuput sequencing and genome wide typing in the development of individualised therapeutic approaches.

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

V (1) + S (1)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

presentation (approx. 10 minutes) with oral examination of one candidate each (approx. 20 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Journal Club			03-TM-JCL-181-m01
Module coordinator		**Module offered by**	
degree programme coordinator Translational Medicine		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students present recent publications from the entire range of Translational Medicine.

Intended learning outcomes

Students can qualitatively assess and question scientific publications. They are capable of describing the accuracy of the approach, the qualitative aspects, the stringency of argumentation and the validity of the conclusions drawn from it.

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 can be chosen to earn a bonus)

presentation (approx. 30 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

60 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

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

Module title			Abbreviation
Disease-Specific Epidemiology			03-TM-KEPI-181-m01
Module coordinator		**Module offered by**	
Institute of Clinical Epidemiology and Biometry (ICE-B)		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

Development of disease-specific study designs and patient-relevant endpoints by means of sspecific study examples; Application of statistical models to individual cases.

Intended learning outcomes

The students learn to define patient-relevant endpoints (e.g., survival time, number of repetitive hospitalizations, different issues of quality of life) depending on specific diseases to characterize the success of diagnostic-therapeutic strategies. Based on the knowledge of the specific course of a patient population determined by the profile and stages of diseases, they will acquire the ability to construct purposeful designs and outcome measures for the optimal capture of the therapeutic progress. It will be pointed out in particular, why a certain outcome measure is relevant for a specific patient population and which is the distinction from other patient populations. Moreover, the students will be able to apply statistical models for prognosis and therapeutic decision making to individual cases.

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

V (2) + S (1)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

oral examination (approx. 30 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Clinical Studies (GCP, AMG, MPG)			03-TM-KLST-181-m01
Module coordinator		**Module offered by**	
Institute of Clinical Epidemiology and Biometry (ICE-B)		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

Design and implementation of clinical trials; conduct of clinical trials according to ethical and legal requirements.

Intended learning outcomes

The students are faced practical issues of the development and implementation of study designs. The acquire knowledge in protocol development, trial documents, ethical issues, patient information, data management and establishing trial procedures in multi-center studies. They learn about trial conduct in accordance with Good Clinical Practice and legal requirements (drug law, medical product law). The course for investigators visited within this setting allows participating physicians to act as trial investigators. Seminaries serve to develop knowledge to practical abilities using examples from the real study world. In addition, the students will acquire special knowledge about design aspects, e.g., sample size calculation.

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

V (1) + S (1)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

oral examination (approx. 30 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Medical Informatics			03-TM-MEDINF-181-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science VI		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

Data bases and data structures; creation and utilization of data warehouses; extraction of information and data transfer; ethical and legal aspects.

Intended learning outcomes

The students are familiar with the organization of different data base systems and their data structures in the clinical domain (e.g., electronic patient file) and in research. They learn how and for what purposes data warehouses are used (e.g., data mining, decision making, case-based training systems) and how to purposefully build them up. The students acquire technical skills in extracting, transforming, linking, transferring and supplying information. They know the ethical and legal requirements for the capture, processing and the use of data. In particular, they are able to apply the relevant law in a specific context and can adequately handle pseudonymization and anonymization of data.

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

V (1.5) + S (1.5)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) Oral examination (approx. 30 minutes) or
b) written examination (approx. 60 minutes)
Language of assessment: German or 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

Supplementary course Translational Medicine (2018)
Master's degree (1 major) Translational Medicine (2018)
Master's degree (1 major) Computer Science (2025)

Module title			Abbreviation
Experimental Methods Course			03-TM-METH-181-m01
Module coordinator		**Module offered by**	
Institute of Hygiene and Microbiology / RVZ		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

Full-time basic molecular Biology practical course with a focus on DNA, RNA, protein, cell biology and microscopy in theory and practical exercises.

Intended learning outcomes

Students know about fundamental analytical methods of relevance to molecular and cell biology and they can apply them practically. Students are able to document and to discuss their results.

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

P (5) + S (1)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Log (approx. 20 pages)
Language of assessment: English

Allocation of places

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Additional information

Additional information on module duration: 3 weeks, full time.

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

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

Module title			Abbreviation
Scientific Writing and Presentation			03-TM-PRES-181-m01
Module coordinator		**Module offered by**	
Graduate School of Life Sciences		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Basic rules for preparation of scientific manuscripts, literature references, and ways of data presentationtion. Gain practice in structured approaches, delineation of a chosen topic, structuring of research questions of compliance with deadlines. Preparation of scientific data for presentation, basic principles of visual design, conception and organization of lectures, rhetoric, and body language.

Intended learning outcomes

The students have learned to retrieve scientific results from the literature or from other sources and to present these in written form. Students can present scientific facts in poster format or orally in an understandable and appealing form.

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

Ü (1) + Ü (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 can be chosen to earn a bonus)

a) Log (approx. 10 to 20 pages) or
b) oral examination in groups (groups of up to 3 candidates, approx. 20 minutes per candidate) or
c) presentation (approx. 20 to 30 minutes)
Type and length/scope of assessment to be specified at the beginning of the course.
Language of assessment: English

Allocation of places

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Additional information

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Workload

60 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

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

Module title			Abbreviation
Prognostic and Diagnostic Studies			03-TM-PROGDIAG-181-m01
Module coordinator		**Module offered by**	
Comprehensive Heart Failure Center (DZHI)		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

Prognostic studies: Prognosis is a key concept in patient care, but the methodology behind it is relatively underdeveloped. The course discusses the principles and methods of non-experimental prognostic research, together with the practice of prognostic research in a clinical setting. Emphasis is on learning and applying design and statistical analysis of prognostic studies, construction and estimation of prediction rules, approaches to validation, and generalization of research results. Further, the challenges of dealing with small data sets will be discussed. Diagnostic studies: Diagnostic processes as diagnostic studies play an increasingly important role. However, awareness of the most appropriate methodology is often poorly developed at the mind of the clinical researcher leading to suboptimal study design and analysis. The course will explain established principles and new challenges arising for example from high dimensional data. Focus will be on implementation of strategies supporting a joint evaluation of sensitivity and specificity in diagnostic studies, the adoption of guidelines for non-standard diagnostic studies (e.g. multiple raters, multiple decisions), the development of approaches to demonstrate the long term clinical benefit of new diagnostic modalities.

Intended learning outcomes

Prognostic studies: Student are able to: apply design and statistical analysis of prognostic studies to selected clinical research questions; construct and estimate prediction rules; have insight into approaches to validation; gain judgement on reliable generalization of research results; can deal with the challenges of prognostic modelling in small data sets. Diagnostic studies: Student will have knowledge on: main elements of diagnostic studies; main elements of test accuracy; main elements ot test utility; how to integrate diagnostic research questions into study design & study planning; main elements of statistical analysis in diagnostic studies; study design options in diagnostic research; main elements how to summarize evidence from several diagnostic studies; main elements on good practice of publication of diagnostic studies.

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

V (1.5) + S (1.5)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 30 to 60 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Service Learning: Community Engagement			03-TM-SERV-181-m01
Module coordinator		**Module offered by**	
holder of the Chair of Didactics of Medicine		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students link their knowledge to the implementation of practical projects, which benefit charitable organizations or public facilities (for example, the accompaniment of self-help groups, press and public relations work). Transfer of knowledge and expertise in practice and formulation / presentation of complex scientific issues in an easily and generally understandable form.

Intended learning outcomes

Subject or discipline-specific competence building, academic character building, strengthening of social commitment:

- Putting theoretical knowledge to the test in practice
- Conveyance or acquirement of personal and social competencies
- Broadening one's horizons and a change of perspective
- The development of a community spirit and a sense of responsibility
- Project management
- Promotion of the orientation of values
- The shared civic responsibility of the University toward shaping the community

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

Ü (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) portfolio or
b) project
Type and length/scope of assessment to be specified at the beginning of the course.
Language of assessment: German or English

Allocation of places

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Additional information

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Workload

60 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

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

Module title			Abbreviation
Master Thesis			03-TM-THESIS-182-m01
Module coordinator		**Module offered by**	
chairperson of examination committee		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

Students conduct a scientific research project with the help of appropriate methods according to current scientific practice. The work is documented and discussed in a thesis and it is defended in a final colloquium.

Intended learning outcomes

Students are qualified to independently carry out scientific work according to the rules of good scientific practice. They are competent to document and to adjust their research and to interpret their findings in a larger context. Students are able to defend their work in front of a professional audience.

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

A (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 can be chosen to earn a bonus)

Master's thesis (approx. 30 to 60 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 Medicine (2018)

Module title			Abbreviation
Selected Courses from other Faculties			03-TM-VAND-181-m01
Module coordinator		**Module offered by**	
chairperson of examination committee		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Prior approval from director of studiesr required.	

Contents

Courses from other faculties that contribute to the professional qualification.

Intended learning outcomes

The students have acquired a wider range of knowledge, which contributes to improved interdisciplinary thinking and supports professional qualification.

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

V (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

oral examination (approx. 30 minutes)
Language of assessment: German or English

Allocation of places

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Additional information

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Workload

60 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

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

Module title			Abbreviation
Selected Courses from Related Study Programs			03-TM-VVER-181-m01
Module coordinator		**Module offered by**	
unknown		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	unknown	Prior approval from director of studiesr required.	

Contents

Students broaden their insights into related disciplines and thereby complement the teaching portfolio of the program.

Intended learning outcomes

Students understand the approaches of related disciplines and are able to apply corresponding concepts and methods to problems in translational medicine. They possess enhanced cooperation and communication skills across disciplinary boundaries.

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

V (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

oral examination (approx. 45 to 60 minutes)
Language of assessment: German or 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

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

Module title			Abbreviation
Winter School			03-TM-WSCH-181-m01
Module coordinator		**Module offered by**	
degree programme coordinator Translational Medicine		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Alternating and comprehensive topics of high relevance from the field of translational medicine are presented and discussed by students, lecturers and external speakers within the framework of a retreat.

Intended learning outcomes

Students learn to comprehensively work on a limited medical topic in small groups and to present it to a professional audience. They can participate in the discussion of current research results in an interdisciplinary context with critical questions.

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 can be chosen to earn a bonus)

presentation (approx. 30 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

60 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

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

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 can be chosen to earn a 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)