Module Catalogue
for the Subject
Experimental medicine
as a Master’s with 1 major
with the degree "Master of Science"
(90 ECTS credits)

Examination regulations version: 2015
Responsible: Faculty of Medicine
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The subject is divided into

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- Methods in Molecular Biology

### Compulsory Electives

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- Cardiovascular Biology
- Molecular Oncology
- Stem Cell Biology
- Tissue Engineering / Functional Materials
- Immunology 1 BM
- Virology 1 BM
- Biomedical courses from other programs
- GSLS PhD student seminar

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- Practical Training Infection and Immunity
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- Master's with 1 major Experimental medicine (2015)
The subject is divided into

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Content and Objectives of the Programme

The Faculty of Medicine at JMU offers a Master of Science (M.Sc.) in Experimental Medicine with a strong emphasis on research. The degree Master of Science offers graduates further professional qualifications as well as extensive research experience. The degree program is suited to students who have completed their studies in Medicine (as their first professional degree) and have a strong interest in fundamental research in the fields of natural sciences and medicine. The degree program allows students to deepen their fundamental knowledge of the natural sciences within the field of Medicine and introduces current methods of biomedical research. The degree program is strongly research oriented and covers current scientific issues in the field of biomedicine as well as experimental approaches and methodological principles within medicine, biology, chemistry, and physics. Through thesis work, students show that they are capable of illustrating and handling a defined issue in the field of experimental medicine from an academic perspective using familiar or modified methods within a given time frame. The Master's examination should confirm the candidate's grasp of biomedical research and his or her ability to independently apply scientific methods. A successfully completed Master's degree qualifies the candidate for admittance to a doctoral program pursuant to the respective and current doctoral program guidelines.
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)):

8-Dec-2015 (2015-249)

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
(15 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Theoretical Medicine</td>
<td>03-EM-TM-152-m01</td>
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**Module coordinator**

Dean of Studies Biomedizin (Biomedicine)

**Module offered by**

Faculty of Medicine

<table>
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<th>ECTS</th>
<th>Method of grading</th>
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**Duration**

1 semester

**Module level**

graduate

**Other prerequisites**

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**Contents**

Research-oriented fundamentals in the field of clinical and theoretical medicine.

**Intended learning outcomes**

Students gain a deeper knowledge of theoretical clinical medicine and its research application.

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

V (3) + V (3) + V (3)

**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) oral examination of one candidate each (20 to 30 minutes) or b) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or c) presentation (20 to 30 minutes).

Students will be informed about the type and length of assessment at the beginning of the course.

Assessment will cover the subjects of microbiology, pharmacology and pathology. There will either be one assessment covering all of the three subjects or three individual assessments.

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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<table>
<thead>
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<td>Methods in Molecular Biology</td>
<td>03-EM-MP-152-m01</td>
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<td>Institute of Hygiene and Microbiology / RVZ</td>
<td>Faculty of Medicine</td>
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<th>Module level</th>
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<td>graduate</td>
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### Contents

Students complete a four-week, full-time molecular biology basic lab course with a focus on DNA, RNA, bioinformatics, proteins, cell biology, microscopy in theory as well as practical exercises.

### Intended learning outcomes

The students have developed a deep knowledge of fundamental analysis/investigative methods of molecular and cell biology. They are able to discuss their results.

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

P (10)

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

Part I: elaboration of logs (approx. 10 to 20 pages). Part II: a) oral examination of one candidate each (20 to 30 minutes) or b) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or c) presentation (20 to 30 minutes).

Students will be informed about the type and length of assessment at the beginning of the course.

Language of assessment: German and/or English

### Allocation of places

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### Additional information

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

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Compulsory Electives

(45 ECTS credits)
Subfield Theoretical Experimental Medicine
(15 ECTS credits)
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<td>Clinical Neurobiology</td>
<td>03-98-MVKN-152-m01</td>
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<tr>
<td>holder of the Chair of Clinical Neurobiology</td>
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<tr>
<td>1 semester</td>
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**Contents**

Students will get a theoretical introduction to neurobiology and 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 literature seminars are based on fundamental literature on lecture-relevant topics to document the experiments underlying our present knowledge in neurobiology.

**Intended learning outcomes**

Students who successfully completed this module will have acquired insights into current theoretical concepts in neurobiology. They will have examined clinical aspects of neurobiology with a focus on the molecular, cellular and physiological mechanisms. Additionally, they will have learned how to evaluate and present data in oral form. The students will have learned to critically read scientific publications in the field of neurobiology 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 (2) + 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) 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).

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

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<td>Cardiovascular Biology</td>
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**Module coordinator**
holder of the Chair of Experimental Biomedicine

**Module offered by**
Faculty of Medicine

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**Duration**
1 semester

**Module level**
graduate

**Other prerequisites**
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**Contents**
Fundamental and specific knowledge of cardiovascular biology is taught based on selected questions from this field.

**Intended learning outcomes**
Students have developed the ability to approach, analyse and interpret general problems in cardiovascular biology and, in particular, in developmental biology, erythropoiesis, blood coagulation, myocardial diseases, diabetes, regulation of blood pressure, platelets and stroke.

**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 is creditable for 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.

Assessment offered: Once a year, winter semester
Language of assessment: German or English

**Allocation of places**
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**Additional information**
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**Referred to in LPO I**
(examination regulations for teaching-degree programmes)
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Module title: Molecular Oncology
Abbreviation: 03-98-MVMO-152-m01

Module coordinator: holder of the Chair of Biochemistry and Molecular Biology

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

Duration: 1 semester
Module level: graduate
Other prerequisites: --

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:
V (2)
Module taught in: German/English

Method of assessment:
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. Assessment offered: Once a year, winter semester
Language of assessment: German or English

Allocation of places:
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Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes):
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<table>
<thead>
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<td>Stem Cell Biology</td>
<td>03-98-MVSZ-152-m01</td>
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<th>Module offered by</th>
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<tbody>
<tr>
<td>Institute of Medical Radiology and Cell Research (MSZ)</td>
<td>Faculty of Medicine</td>
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<th>Module level</th>
<th>Other prerequisites</th>
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<td>1 semester</td>
<td>graduate</td>
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**Contents**

In this module, current problems in the research areas of stem cell biology, cellular differentiation and regenerative medicine are discussed and specific solutions are taught.

**Intended learning outcomes**

Students have developed the ability to approach, analyse and critically interpret problems in stem cell biology, cellular differentiation and regenerative medicine, taking into account current literature.

**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 is creditable for 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.

Assessment offered: Once a year, summer semester

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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

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### Module title
Tissue Engineering / Functional Materials

### Abbreviation
03-98-MVT-152-m01

<table>
<thead>
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<tbody>
<tr>
<td>holder of the Chair of Tissue Engineering (University Hospital)</td>
<td>Faculty of Medicine</td>
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<td>1 semester</td>
<td>graduate</td>
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### Contents
- Cell culture techniques, fundamentals of tissue engineering, test systems as an alternative to animal experiments in skin, intestine, lung, trachea, kidney, blood-brain barrier, tumours and other diseases, development of cell-based transplants, regulatory fundamentals for approval of medical products and drugs. These are REACH (registration, evaluation, restriction and approval of drugs), medicine products law, GLP (good lab practice), GMP (good manufacturing practice), GCP (good clinical practice).

### Intended learning outcomes
- Students have developed a knowledge of cell biology, metabolism, differentiation, adhesion to surfaces, mechanobiology. They are familiar with the fundamental principles of tissue engineering and quality management.

### Courses
- **V (2)**
  - Module taught in: German/English

### Method of assessment
- 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.

**Assessment offered:** Once a year, winter semester

**Language of assessment:** German or English

### Allocation of places
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### Additional information
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### Referred to in LPO I
( examination regulations for teaching-degree programmes)
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<table>
<thead>
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<tr>
<td>Immunology 1 BM</td>
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**Module coordinator**

holder of the Professorship of Immunogenetics

**Module offered by**

Faculty of Medicine

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**Duration**

1 semester

**Module level**

graduate

**Other prerequisites**

--

**Contents**

Familiarity with the fundamentals of molecular and cellular immunology that allow a deeper understanding of immune-mediated defence mechanisms. This incorporates common literature readings, presentations and tests on selected immunology book chapters and recent original literature in English language.

**Intended learning outcomes**

Students will gain a knowledge of fundamental concepts and methods in molecular and cellular immunology and will be able to present and discuss these.

**Courses**

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

S (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 is creditable for bonus)

a) written examination (30 to 60 minutes) or b) oral examination of one candidate each (30 to 60 minutes) or c) presentation (20 to 45 minutes)

Students will be informed about the method, length and scope of the assessment prior to the course.

Assessment offered: Winter semester only

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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

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<table>
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<td>Virology 1 BM</td>
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<tr>
<td>Other prerequisites</td>
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<tr>
<td>Contents</td>
<td>This module will discuss contemporary topics in virology.</td>
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<tr>
<td>Intended learning outcomes</td>
<td>Students are able to understand current problems in virology and to discuss these in detail.</td>
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<td>Courses</td>
<td>V (1) + S (2)</td>
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<td>German/English</td>
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<td>German and/or English</td>
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<td>Allocation of places</td>
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<td>Additional information</td>
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Module title | Abbreviation
---|---
Biomedical courses from other programs | 03-EM-VAND-152-m01

Module coordinator | Module offered by
Dean of Studies Biomedizin (Biomedicine) | Faculty of Medicine

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<td>numerical grade</td>
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Duration | Module level | Other prerequisites
1 semester | graduate | Please consult with degree programme coordinator in advance.

Contents
Courses from other degree programmes that contribute to further professional qualification. Recognition (successfully completed/not successfully completed) as assessment to be granted by the module coordinator.

Intended learning outcomes
The students have acquired a broader range of knowledge that enables them to enhance their interdisciplinary thinking skills and improve their professional qualification.

Courses (type, number of weekly contact hours, language — if other than German)
V (3)
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 is creditable for bonus)
a) written examination (30 to 60 minutes) 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)
Students will be informed about the method, length and scope of the assessment prior to the course.
Language of assessment: German and/or English

Allocation of places
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Additional information
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<td>holder of the Chair of Sociology and Sociological Theory</td>
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<th>Duration</th>
<th>Module level</th>
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<tbody>
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<td>1 semester</td>
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**Contents**

- No information on contents available.

**Intended learning outcomes**

- No information on intended learning outcomes available.

**Courses**

- Module taught in: German/English

- **Method of assessment**

  - presentation (20 to 30 minutes)
  - Language of assessment: German and/or English

**Allocation of places**

- --

**Additional information**

- --

**Referred to in LPO I**

- (examination regulations for teaching-degree programmes)

- --
Subfield Practical Experimental Medicine
(20 ECTS credits)
## Module title

| Practical Biochemistry and Molecular Biology | 03-EM-PBMB-152-m01 |

## Module coordinator

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holders of the Chairs of Physiological Chemistry, Developmental Biochemistry, Biochemistry and Molecular Biology</td>
<td>Faculty of Medicine</td>
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## ECTS

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## Duration

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<th>Module level</th>
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<tbody>
<tr>
<td></td>
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## Contents

Students spend 4 to 6 weeks working on their own small, well-defined scientific lab project in the area of multifunctional biochemistry and molecular biology and present the results of the laboratory project at the Institute seminar.

## Intended learning outcomes

Participating in clinically-oriented research projects, students gain initial hands-on experience. They reinforce previously acquired lab skills, acquire new lab techniques, and learn how to apply theoretical knowledge in the lab. Students gain expertise in the analysis and presentation of raw data.

## Courses

<table>
<thead>
<tr>
<th>Courses (type, number of weekly contact hours, language — if other than German)</th>
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<tbody>
<tr>
<td>P (10)</td>
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</table>

**Module taught in:** German/English

## Method of assessment

<table>
<thead>
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<th>Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)</th>
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</thead>
<tbody>
<tr>
<td>practical assignment with log (approx. 10 to 20 pages) and oral examination (approx. 15 to 30 minutes) Language of assessment: German and/or English</td>
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## Allocation of places

--

## Additional information

--

## Referred to in LPO 1

(examination regulations for teaching-degree programmes)

--
### Module title

**Practical Training Molecular Oncology**

### Abbreviation

03-EM-PMO-152-m01

### Module coordinator

holder of the Chair of Biochemistry and Molecular Biology

### Module offered by

### ECTS

<table>
<thead>
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</thead>
<tbody>
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### Duration

graduate

### Contents

Students spend 4 to 6 weeks working on their own small, well-defined scientific lab project in the area of molecular oncology and present the results of the laboratory project at the Institute seminar.

### Intended learning outcomes

Participating in clinically-oriented research projects, students gain initial hands-on experience. They reinforce previously acquired lab skills, acquire new lab techniques, and learn how to apply theoretical knowledge in the lab. Students gain expertise in the analysis and presentation of raw data.

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

P (10)

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 is creditable for bonus)

practical assignment with log (approx. 10 to 20 pages) and oral examination (approx. 15 to 30 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

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

--
## Module Catalogue for the Subject
### Experimental medicine

**Master's with 1 major, 90 ECTS credits**

<table>
<thead>
<tr>
<th>Module title</th>
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<td></td>
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### Contents

Students spend 4 to 6 weeks working on their own small, well-defined scientific lab project in the area of cardiovascular biology and present the results of the laboratory project at the Institute seminar.

### Intended learning outcomes

Participating in clinically-oriented research projects, students gain initial hands-on experience. They reinforce previously acquired lab skills, acquire new lab techniques, and learn how to apply theoretical knowledge in the lab. Students gain expertise in the analysis and presentation of raw data.

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

P (10)

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 is creditable for bonus)

- Practical assignment with log (approx. 10 to 20 pages) and oral examination (approx. 15 to 30 minutes)
- Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

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

--
Module title: Practical Training Infection and Immunity

Abbreviation: 03-EM-PInIm-152-m01

Module coordinator:
Institute of Virology and Immunobiology

Module offered by:
Faculty of Medicine

ECTS: 10
Method of grading: numerical grade
Duration: graduate

Other prerequisites:
--

Contents:
Students spend 4 to 6 weeks working on their own small, well-defined scientific lab project in the area of infection and immunity and present the results of the laboratory project at the Institute seminar.

Intended learning outcomes:
Participating in clinically-oriented research projects, students gain initial hands-on experience. They reinforce previously acquired lab skills, acquire new lab techniques, and learn how to apply theoretical knowledge in the lab. Students gain expertise in the analysis and presentation of raw data.

Courses:
Type: P (10)
Number of weekly contact hours: 10
Language: German/English

Method of assessment:
Type: practical assignment with log (approx. 10 to 20 pages) and oral examination (approx. 15 to 30 minutes)
Scope: Language of assessment: German and/or English

Allocation of places:
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Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<td>Practical Training Neurobiology</td>
<td>03-EM-PNB-152-m01</td>
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**Module coordinator**
holder of the Chair of Clinical Neurobiology

**Module offered by**
Faculty of Medicine

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**Duration**
graduate

**Other prerequisites**
--

**Contents**
Students spend 4 to 6 weeks working on their own small, well-defined scientific lab project in the area of neurobiology and neurophysiology and present the results of the laboratory project at the Institute seminar.

**Intended learning outcomes**
Participating in clinically-oriented research projects, students gain initial hands-on experience. They reinforce previously acquired lab skills, acquire new lab techniques, and learn how to apply theoretical knowledge in the lab. Students gain expertise in the analysis and presentation of raw data.

**Courses** (type, number of weekly contact hours, language — if other than German)
P (10)
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 is creditable for bonus)
practical assignment with log (approx. 10 to 20 pages) and oral examination (approx. 15 to 30 minutes)
Language of assessment: German and/or English

**Allocation of places**
--

**Additional information**
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**Referred to in LPO I** (examination regulations for teaching-degree programmes)
--
### Practical Training Stem Cell Biology and Regenerative Medicine

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<tbody>
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<td>Practical Training Stem Cell Biology and Regenerative Medicine</td>
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<tr>
<td>holder of the Chair of Tissue Engineering and Regenerative Medicine / head of the Institute of Medical Radiology and Cell Research (MSZ)</td>
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</table>

**Contents**

Students spend 4 to 6 weeks working on their own small, well-defined scientific lab project in the area of stem cell biology and/or regenerative medicine and present the results of the laboratory project at the Institute seminar.

**Intended learning outcomes**

Participating in clinically-oriented research projects, students gain initial hands-on experience. They reinforce previously acquired lab skills, acquire new lab techniques, and learn how to apply theoretical knowledge in the lab. Students gain expertise in the analysis and presentation of raw data.

**Courses**

- **P (10)**  
  Module taught in: German/English

**Method of assessment**

- practical assignment with log (approx. 10 to 20 pages) and oral examination (approx. 15 to 30 minutes)  
  Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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<table>
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### Contents

No information on contents available.

### Intended learning outcomes

No information on intended learning outcomes available.

### Courses

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

P (10)

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 is creditable for bonus)

a) written examination (30 to 60 minutes) 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).

Students will be informed about the method, length and scope of the assessment prior to the course.

### Allocation of places

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### Additional information

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

--
Subfield Organisation and Communication of Science
(10 ECTS credits)
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<th>Module title</th>
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<td>Genetic Engineering and Biosafety</td>
<td>03-98-FSQ-GEN-152-m01</td>
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<th>Module coordinator</th>
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<tbody>
<tr>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>--</td>
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</table>

### Contents
The theoretical foundations of genetic engineering and genetic engineering safety regulations; applications of genetic engineering.

### Intended learning outcomes
The students are familiar with methods of genetic engineering as well as relevant legal provisions regarding genetic engineering safety and biomaterials.

### 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 is creditable for 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
--

### Additional information
Students MUST take this module.

### Referred to in LPO 1
(examination regulations for teaching-degree programmes)

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<table>
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<td>Laboratory Animal Sciences 2</td>
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<tbody>
<tr>
<td>holder of the Chair of Experimental Biomedicine and Animal Welfare Officer of the University of Würzburg</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>--</td>
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</tbody>
</table>

**Contents**

Theoretical and practical basic knowledge of animal welfare legislation, animal welfare ethics and laboratory animal science.

**Intended learning outcomes**

Students have the expertise to carry out or participate in animal experiments according to the guidelines of FELASA (Cat. B).

**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 is creditable for bonus)

written examination (approx. 90 minutes)

**Allocation of places**

--

**Additional information**

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

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

--
## Module Catalogue for the Subject

### Experimental medicine

#### Master’s with 1 major, 90 ECTS credits

<table>
<thead>
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<td>Biometry I</td>
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</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</tbody>
</table>

### Contents

Basics of the statistical software SPSS; data preparation; descriptive statistics; basic methods of inference statistics. Advanced part: statistical modelling by multiple regression for metric, binary, ordinal and survival data.

### Intended learning outcomes

The students are able to create data tables, to import and export data, to pool and merge as well as to transform and recode data. They have learned to describe data numerically by statistical measures and to represent it graphically. They are familiar with significance tests and confidence estimates as well as fundamental methods for one and two-sample problems. Advanced part: The students perform multiple regression analyses by the general linear model, binary and ordinal logistic regression as well as Cox regression (including time-dependent covariates) and are able to test for interaction effects.

### Courses

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

V (1) + S (1) + Ü (1)

### 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 (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

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
### Module title

**Selected Courses from Life Sciences**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Selected Courses from Life Sciences</td>
<td>03-EM-FSQ-MB-152-m01</td>
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### Module coordinator

Dean of Studies Biomedizin (Biomedicine)

### Module offered by

Dean of Studies Biomedizin (Biomedicine)

### Faculty of Medicine

### ECTS

2

### Method of grading

Only after succ. compl. of module(s)

### (not) successfully completed

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### Duration

1 semester

### Module level

graduate

### Other prerequisites

Prior approval from degree programme coordinator required.

### Contents

Courses offered by the Faculties of Biology or Medicine that contribute to further professional qualification. Recognition (successfully completed/not successfully completed) as assessment to be granted by the module coordinator.

### Intended learning outcomes

The students have acquired a broader range of knowledge that enables them to enhance their interdisciplinary thinking skills and improve their professional qualification.

### 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 is creditable for 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

--

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
### Module title
Responsible Conduct of Research

### Abbreviation
07-MLSRR1-152-m01

### Module coordinator
Dean of Studies Biologie (Biology)

### Module offered by
Faculty of Biology

### ECTS
2

### Method of grading
Only after succ. compl. of module(s)

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
Responsible and ethical conduct of research, content and importance of compliance with international regulations to this end, information on national and international authorities regulating rules of conduct of research, biosafety and risks.

### Intended learning outcomes
Students meet the academic requirements/possess the knowledge and skills required of a biosafety officer. They have developed an awareness of critical elements in quality management and quality control in research labs. Students know national and international authorities that are responsible for the regulation and control of good scientific conduct and ethical questions involving, in particular, genetically modified organisms. Students understand crucial elements of responsible and ethical conduct of research as well as the consequences of a violation of these rules.

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

S (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) log (10 to 20 pages) or b) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or c) presentation (20 to 30 minutes).

Students will be informed about the type and length of assessment at the beginning of the course.

Language of assessment: English

### Allocation of places
--

### Additional information
--

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

--
### Module Catalogue for the Subject

**Experimental medicine**

**Master's with 1 major, 90 ECTS credits**

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

#### Contents

Design and organisation of presentations, rhetoric and body language.

#### Intended learning outcomes

Students are able orally to present scientific results in an understandable and appropriate manner.

#### Courses

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<th>Ü (1)</th>
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<tbody>
<tr>
<td>Module taught in: English</td>
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#### Method of assessment

a) log (10 to 20 pages) or b) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or c) presentation (20 to 30 minutes).

Students will be informed about the type and length of assessment at the beginning of the course.

Language of assessment: English

#### Allocation of places

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#### Additional information

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#### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<table>
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<td>03·EM-WRI-152·m01</td>
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## Contents

Basic rules for the preparation of scientific manuscripts, literature references and ways of data presentation. Gaining practice in structured approaches, delineation of a chosen topic, structuring of research questions, compliance with deadlines.

## Intended learning outcomes

The students have learned to retrieve scientific results from literature or from other sources and to present these in written form.

## Courses

<table>
<thead>
<tr>
<th>(type, number of weekly contact hours, language — if other than German)</th>
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</table>

Module taught in: English

## Method of assessment

(a) log (10 to 20 pages) or (b) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or (c) presentation (20 to 30 minutes).

Students will be informed about the type and length of assessment at the beginning of the course.

Language of assessment: English

## Allocation of places

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## Additional information

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## Referred to in LPO 1

(examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
<th>Module title</th>
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<td>Poster Design</td>
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**Contents**
Preparation of scientific data for presentation, fundamental principles of visual design.

**Intended learning outcomes**
Students are able to present scientific facts in poster format.

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

| 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 is creditable for bonus)

a) log (10 to 20 pages) or b) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or c) presentation (20 to 30 minutes).

Students will be informed about the type and length of assessment at the beginning of the course.

Language of assessment: English

**Allocation of places**
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**Additional information**
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**Referred to in LPO I** (examination regulations for teaching-degree programmes)
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**Thesis**

(30 ECTS credits)
## Module Catalogue for the Subject

Experimental medicine

Master’s with 1 major, 90 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>chairperson of examination committee of complementary non-degree programme Experimentelle Medizin (Experimental Medicine)</td>
<td>Faculty of Medicine</td>
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### Contents

Students conduct a scientific research project, using appropriate methods and adhering to the principles of good scientific practice. They document and discuss their work in a thesis and defend it in a final colloquium.

### Intended learning outcomes

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

### Courses

No courses assigned to module

### Method of assessment

Master’s thesis (approx. 30 to 60 pages)
Language of assessment: English

### Allocation of places

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### Additional information

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### Referred to in LPO 1

(examination regulations for teaching-degree programmes)

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## Module Catalogue for the Subject
Experimental medicine

### Master's with 1 major, 90 ECTS credits

<table>
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<td>Dean of Studies Biomedizin (Biomedicine)</td>
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### Contents

Students present the results of their thesis projects 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)

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### Method of assessment

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

- final colloquium (approx. 30 to 45 minutes)
- Language of assessment: English

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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