Subdivided Module Catalogue
for the Subject

Biomedicine

as a Master’s with 1 major
with the degree "Master of Science"
(120 ECTS credits)

Examination regulations version: 2013
Responsible: Faculty of Medicine
Responsible: Faculty of Biology
Course of Studies - Contents and Objectives

The Faculty of Medicine and the Faculty of Biology of the JMU Würzburg offer the opportunity to acquire a “Master of Science” (M.Sc.) degree in Biomedicine within a consecutive Bachelor’s and Master’s programme. This degree programme has a strong emphasis on research. This Master of Science degree equips graduates with further professional qualifications as well as extensive research experience. This degree programme aims to impart to students in-depth and interdisciplinary knowledge at the interface between biology and medicine and to enable them to competently apply and implement concepts and methods of molecular medicine. Students in this degree programme gain the skills and specialist knowledge necessary for a career in research, development and practical application and will be able to independently conduct scientific research in the field of biomedicine.

In their thesis, students demonstrate their ability to illustrate and handle a defined biomedical problem from an academic perspective using established or modified methods within a given time frame.

By passing their Master’s examination, students demonstrate their grasp of biomedical research and their ability to independently apply scientific methods. In compliance with the effective doctoral regulations of the JMU a successfully completed Master's degree qualifies candidates for admission to a doctoral programme.
**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: \( \text{NUM} \) = numerical grade, \( B/NB \) = (not) successfully completed

Regulations: \((L)\text{ASPO}\) = general academic and examination regulations (for teaching-degree programmes), \( \text{FSB} \) = subject-specific provisions, \( \text{SFB} \) = 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:

\( \text{ASPO2009} \)

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

\( 23-\text{Sep-2013 (2013-72)} \)

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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Module title</th>
<th>ECTS credits</th>
<th>Method of grading</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compulsory Courses (60 ECTS credits)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lab Course Model Organisms (25 ECTS credits)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03-98-MMOD-132-m01</td>
<td>Model Organisms</td>
<td>25</td>
<td>NUM</td>
<td>20</td>
</tr>
<tr>
<td><strong>Advanced Lab Courses (20 ECTS credits)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03-98-MFPB-132-m01</td>
<td>Advanced Laboratory Course in Biology</td>
<td>10</td>
<td>NUM</td>
<td>7</td>
</tr>
<tr>
<td>03-98-MFPM-132-m01</td>
<td>Advanced Laboratory Course in Medicine</td>
<td>10</td>
<td>NUM</td>
<td>8</td>
</tr>
<tr>
<td><strong>Research Lab Course (15 ECTS credits)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03-98-MPFF-122-m01</td>
<td>Internship in a research lab</td>
<td>15</td>
<td>B/NB</td>
<td>22</td>
</tr>
<tr>
<td><strong>Compulsory Electives (30 ECTS credits)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compulsory Electives I (25 ECTS credits)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completion of modules 03-98-MVKN, 03-98-MVKB and 03-98-MVMO is mandatory. Module 07-MBI-B may only be taken by students that did not take 07-MBI-B in the Bachelor’s degree programme.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07-MBI-B-121-m01</td>
<td>Bioinformatics B</td>
<td>5</td>
<td>B/NB</td>
<td>6</td>
</tr>
<tr>
<td>07-MS-B-121-m01</td>
<td>Systems Biology B</td>
<td>5</td>
<td>B/NB</td>
<td>24</td>
</tr>
<tr>
<td>07-MM1-B-121-m01</td>
<td>Microbiology 1 B</td>
<td>5</td>
<td>B/NB</td>
<td>18</td>
</tr>
<tr>
<td>07-MM2-B-121-m01</td>
<td>Microbiology 2 B</td>
<td>5</td>
<td>B/NB</td>
<td>19</td>
</tr>
<tr>
<td>07-MZE1-B-121-m01</td>
<td>Cell- and Development-Biology Master 1 B</td>
<td>3</td>
<td>B/NB</td>
<td>30</td>
</tr>
<tr>
<td>07-MZE2-B-121-m01</td>
<td>Cell- and Development-Biology Master 2 B</td>
<td>3</td>
<td>B/NB</td>
<td>31</td>
</tr>
<tr>
<td>03-MIM1-B-121-m01</td>
<td>Immunology 1 B</td>
<td>7</td>
<td>B/NB</td>
<td>9</td>
</tr>
<tr>
<td>03-MIM2-B-121-m01</td>
<td>Immunology 2 B</td>
<td>7</td>
<td>B/NB</td>
<td>11</td>
</tr>
<tr>
<td>03-MIM1-BS-121-m01</td>
<td>Immunology 1 BS</td>
<td>5</td>
<td>B/NB</td>
<td>10</td>
</tr>
<tr>
<td>03-MIM2-BS-121-m01</td>
<td>Immunology 2 BS</td>
<td>5</td>
<td>B/NB</td>
<td>12</td>
</tr>
<tr>
<td>03-MV1-B-121-m01</td>
<td>Virology 1 B</td>
<td>7</td>
<td>B/NB</td>
<td>26</td>
</tr>
<tr>
<td>03-MV2-B-121-m01</td>
<td>Virology 2 B</td>
<td>7</td>
<td>B/NB</td>
<td>27</td>
</tr>
<tr>
<td>03-98-MVKN-122-m01</td>
<td>Clinical Neurobiology</td>
<td>5</td>
<td>NUM</td>
<td>17</td>
</tr>
<tr>
<td>03-98-MVKB-122-m01</td>
<td>Cardiovascular Biology</td>
<td>5</td>
<td>NUM</td>
<td>13</td>
</tr>
<tr>
<td>03-98-MVMO-122-m01</td>
<td>Molecular Oncology</td>
<td>5</td>
<td>NUM</td>
<td>21</td>
</tr>
<tr>
<td>03-98-MVSZ-122-m01</td>
<td>Stem Cell Biology</td>
<td>5</td>
<td>NUM</td>
<td>23</td>
</tr>
<tr>
<td>03-98-MVTF-122-m01</td>
<td>Tissue Engineering / Functional Materials</td>
<td>5</td>
<td>NUM</td>
<td>25</td>
</tr>
<tr>
<td>07-MKE-WO-121-m01</td>
<td>Nucleus Workshop</td>
<td>7</td>
<td>B/NB</td>
<td>14</td>
</tr>
<tr>
<td><strong>Compulsory Electives II (5 ECTS credits)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03-98-MTUT2-122-m01</td>
<td>Knowledge Transfer / Tutoring</td>
<td>2</td>
<td>B/NB</td>
<td>28</td>
</tr>
<tr>
<td>03-98-MTUT3-122-m01</td>
<td>Knowledge Transfer / Tutoring</td>
<td>3</td>
<td>B/NB</td>
<td>29</td>
</tr>
<tr>
<td>03-98-MKM2-122-m01</td>
<td>Clinical Medicine</td>
<td>2</td>
<td>B/NB</td>
<td>15</td>
</tr>
<tr>
<td>03-98-MKM3-122-m01</td>
<td>Clinical Medicine</td>
<td>3</td>
<td>B/NB</td>
<td>16</td>
</tr>
<tr>
<td><strong>Thesis (30 ECTS credits)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thesis and colloquium.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03-98-MTH-122-m01</td>
<td>Final Oral Examination</td>
<td>30</td>
<td>NUM</td>
<td>5</td>
</tr>
</tbody>
</table>
## Module title

**Final Oral Examination**

**Abbreviation**

03-98-MTH-122-m01

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>numerical grade</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

### 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

This module has 2 components; information on courses listed separately for each component.

- 03-98-MTH-2-122: K (no information on language and number of weekly contact hours available)
- 03-98-MTH-1-122: A (no information on language and number of weekly contact hours available)

### Method of assessment

This module has the following 2 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole.

**Assessment component to module component 03-98-MTH-2-122:** Abschlusskolloquium

- 5 ECTS credits, method of grading: numerical grade
- Abschlusskolloquium (approx. 45 minutes)
- Language of assessment: English

**Assessment component to module component 03-98-MTH-1-122:** Masterthesis

- 25 ECTS credits, method of grading: numerical grade
- written thesis
- Language of assessment: English

### Allocation of places

--

### Additional information

Additional information listed separately for each module component.

- 03-98-MTH-1-122: Additional information on module duration: 6 months.
- 03-98-MTH-2-122: --

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioinformatics B</td>
<td>07-MBI-B-121-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holder of the Chair of Bioinformatics</td>
<td>Faculty of Biology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>(not) successfully completed</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**Contents**

Advances and current results of bioinformatics are explained and discussed, this includes results from genome and sequence analysis, protein domains and protein families, large-scale data analysis (e.g. net generation sequences, proteomics data), analysis of different functional RNAs (e.g. miRNAs, IncRNAs).

**Intended learning outcomes**

Understand recent results in bioinformatics. Discuss their implications. Have an advanced (Master) level knowledge of typical technologies and research questions in bioinformatics.

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

V (no information on SWS (weekly contact hours) and course language available)

**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)

Students will be informed about the method, length and scope of the assessment prior to the course. 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 (30 to 60 minutes)

**Allocation of places**

--

**Additional information**

--

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

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Laboratory Course in Biology</td>
<td>03-98-MFPB-132-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean of Studies Biomedizin (Biomedicine)</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>numerical grade</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**Contents**
Participation in a research project in the life sciences. Students will become familiar with new methods and approaches. Contents and methods will vary according to the research laboratory chosen.

**Intended learning outcomes**
Application of current methods to diverse and complex scientific questions. Critical data collection and analysis as well as interpretation of new findings. Presentation of data.

**Courses** (type, number of weekly contact hours, language — if other than German)
P (no information on SWS (weekly contact hours) and course language available)

<table>
<thead>
<tr>
<th>Method of assessment</th>
<th>(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>methods of assessment: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes); students will be informed about the method, length and scope of the assessment prior to the course</td>
<td>Language of assessment: German or English</td>
</tr>
</tbody>
</table>

**Allocation of places**
--

**Additional information**
--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)
--
### Advanced Laboratory Course in Medicine

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Laboratory Course in Medicine</td>
<td>03-98-MFPM-132-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean of Studies Biomedizin (Biomedicine)</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>numerical grade</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>Prior approval by Dean of Studies required.</td>
</tr>
</tbody>
</table>

### Contents

Participation in a research project in the life sciences. Students will become familiar with new methods and approaches. Contents and methods will vary according to the research laboratory chosen.

### Intended learning outcomes

Application of current methods to diverse and complex scientific questions. Critical data collection and analysis as well as interpretation of new findings. Presentation of data.

### Courses

P (no information on SWS (weekly contact hours) and course language available)

### Method of assessment

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

Language of assessment: German or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title
Immunology 1 B

Abbreviation
03-MIM1-B-121-m01

Module coordinator
holder of the Professorship of Immunogenetics

Module offered by
Faculty of Medicine

ECTS
7

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

(not) successfully completed
--

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)
V + S (no information on SWS (weekly contact hours) and course language available)

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

Allocation of places
--

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunology 1 BS</td>
<td>03-MIM1-BS-121-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holder of the Professorship of Immunogenetics</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>(not) successfully completed</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**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 (no information on SWS (weekly contact hours) and course language available)

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

**Allocation of places**

--

**Additional information**

--

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

--
Module title | Abbreviation
--- | ---
Immunology 2 B | 03-MIM2-B-121-m01

Module coordinator | Module offered by
holder of the Professorship of Immunogenetics | Faculty of Medicine

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

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

Contents
Recent progress in molecular and cellular immunology. Deeper insights into selected immunology chapters, such as autoimmunity and immune modulation, development of the immune system, immunogenetics, evolution, infection immunology, and more. This incorporates common literature readings, presentations and tests on selected immunology book chapters and recent original literature.

Intended learning outcomes
Students are able to understand current problems in immunology and to discuss these in detail.

Courses (type, number of weekly contact hours, language — if other than German)
S + V (no information on SWS (weekly contact hours) and course language available)

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

Allocation of places
--

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
## Module title
Immunology 2 BS

## Abbreviation
03-MIM2-BS-121-m01

### Module coordinator
holder of the Professorship of Immunogenetics

### Module offered by
Faculty of Medicine

### ECTS
5

### Method of grading
(only after successfully completed module(s))

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

## Contents
Recent progress in molecular and cellular immunology. Deeper insights into selected immunology chapters, such as autoimmunity and immune modulation, development of the immune system, immunogenetics, evolution, infection immunology, and more. This incorporates common literature readings, presentations and tests on selected immunology book chapters and recent original literature.

## Intended learning outcomes
Students are able to understand current problems in immunology and to discuss these in detail.

## Courses
(no information on SWS (weekly contact hours) and course language available)

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

## Allocation of places
--

## Additional information
--

## Referred to in LPO I
(examination regulations for teaching-degree programmes)
--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular Biology</td>
<td>03-98-MVKB-122-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holder of the Chair of Experimental Biomedicine</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>numerical grade</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**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 (no information on SWS (weekly contact hours) and course language available)

**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)

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

**Allocation of places**

--

**Additional information**

--

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

--
### Subdivided Module Catalogue for the Subject Biomedicine

#### Master's with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nucleus Workshop</td>
<td>07-MKE-WO-121-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>degree programme coordinator Biologie (Biology)</td>
<td>Faculty of Biology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>(not) successfully completed</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Contents

This course will use a combination of lectures (daily) and practical experiments. Topics to be covered in the lecture (subject to change): - nuclear envelope, nuclear pores and nuclear-cytoplasmic transport. - nuclear envelope, nuclear lamina and their role in chromatin organisation and genetic diseases. - DNA, chromatin and chromosomes. - structure and function of nucleoli. - nuclear-cytoskeletal interactions.

#### Intended learning outcomes

Students are able to perform practical experiments, applying their theoretical knowledge.

##### Courses

Ü + V (no information on SWS (weekly contact hours) and course language available)

##### Method of assessment

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

#### Allocation of places

- 

#### Additional information

- 

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

-
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Medicine</td>
<td>03-98-MKM2-122-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean of Studies Biomedizin (Biomedicine)</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>(not) successfully completed</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**Contents**

Attending a lecture on the foundations of clinical medicine for medical students. Contents will vary according to the subject chosen.

**Intended learning outcomes**

Students will gain an insight into clinical practice and will improve their ability to link basic and experimental knowledge with corresponding clinical applications.

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

V (no information on SWS (weekly contact hours) and course language available)

**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)

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

**Allocation of places**

--

**Additional information**

--

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

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Medicine</td>
<td>03-98-MKM3-122-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean of Studies Biomedizin (Biomedicine)</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>(not) successfully completed</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**Contents**

Attending a lecture on the foundations of clinical medicine for medical students. Contents will vary according to the subject chosen.

**Intended learning outcomes**

Students will gain an insight into clinical practice and will improve their ability to link basic and experimental knowledge with corresponding clinical applications.

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

V (no information on SWS (weekly contact hours) and course language available)

**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)

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

**Allocation of places**

--

**Additional information**

--

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

--
Module title          Abbreviation
Clinical Neurobiology 03-98-MVKN-122-m01

Module coordinator Module offered by
holder of the Chair 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 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 (no information on SWS (weekly contact hours) and course language available)

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

Allocation of places
--

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
**Module title**  
Microbiology 1 B

**Abbreviation**  
07-MM1-B-121-m01

**Module coordinator**  
holder of the Chair of Microbiology

**Module offered by**  
Faculty of Biology

**ECTS**  
5

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

**Duration**  
1 semester

**Module level**  
graduate

**Other prerequisites**  
--

### Contents

Fundamentals of molecular microbiology and infection biology, mechanisms of adherence and invasion, bacterial pathogenicity factors, regulation of virulence, mechanisms of host defence and pathogen interference, current methods in infection biology.

### Intended learning outcomes

The students are able to understand fundamental theories of molecular microbiology and infection biology, emergence of infectious diseases.

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

V (no information on SWS (weekly contact hours) and course language available)

### 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 (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

### Allocation of places

--

### Additional information

--

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

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microbiology 2 B</td>
<td>07-MM2-B-121-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holder of the Chair of Microbiology</td>
<td>Faculty of Biology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>(not) successfully completed</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

### Contents

Fundamental principles of the mode of action of microbial pathogenicity factors will be presented using selected prokaryotic and eukaryotic pathogens as model organisms. In addition, current research methods in infection biology will be presented.

### Intended learning outcomes

Students have gained fundamental knowledge in infection biology and pathogenicity research and the mechanisms behind infectious diseases.

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

V (no information on SWS (weekly contact hours) and course language available)

### 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 (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

### Allocation of places

--

### Additional information

--

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

--
### Module title
**Model Organisms**

### Abbreviation
03-98-MMOD-132-m01

### Module coordinator
Dean of Studies Biomedizin (Biomedicine)

### Module offered by
Faculty of Medicine

### ECTS
25

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
--

### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
--

### Contents
With the help of selected eukaryotic model organisms (mouse, fish, Drosophila, nematodes and flatworms, yeast) and complex tissue models, students will become familiar with methods and questions of experimental biomedicine and will apply these. Building on the students' knowledge of anatomy, cell biology and developmental biology, the module will illustrate the relevance and usage of individual models for understanding physiological processes and pathophysiological changes and will experimentally analyse these with molecular, cell biological, histological and imaging techniques. The module will acquaint students with cell-based strategies for regenerative therapies and biodiagnostics as well as as an alternative to animal experiments. Over the course of one week each, students will examine model organisms in detail, also taking into account current research.

### Intended learning outcomes
Students are able to define key terms for each model organism and use them in the right context. They are able to correctly assess the importance of model organisms and 3D tissue culture systems for current biomedical issues and questions. They are able to discuss the relevant scientific advantages and disadvantages in a deliberative manner, also taking into account ethical issues. Under supervision, they are able to independently perform sophisticated genetic, cell biological and histological experiments and document the results. In particular, they are able to present the results in a written report in accordance with scientific standards, to critically evaluate and interpret the data and put it in the context of current literature. Working in small groups as well as preparing and delivering group presentations, they demonstrate their knowledge of the contents covered as well as their team working skills.

### Courses
**S + P** (no information on SWS (weekly contact hours) and course language available)

### 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)

per block of organisms: one log (5 to 10 pages each) as well as one of the following assessments: 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) presentation (20 to 45 minutes)

### Allocation of places
--

### Additional information
--

### Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Module title: Molecular Oncology
Abbreviation: 03-98-MVMO-122-m01

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

Module offered by:

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

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 (type, number of weekly contact hours, language — if other than German):
V (no information on SWS (weekly contact hours) and course language available)

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

Allocation of places:
--

Additional information:
--

Referred to in LPO I (examination regulations for teaching-degree programmes):
--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internship in a research</td>
<td>03-98-MPPF-122-m01</td>
</tr>
<tr>
<td>lab</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean of Studies Biomedizin (Biomedicine)</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>(not) successfully completed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>Prior approval by Dean of Studies required.</td>
</tr>
</tbody>
</table>

**Contents**

Project work in a research laboratory, focusing on training in new methods and the in-depth analysis of a complex scientific problem. This project may lay the foundation for a subsequent Master's thesis.

**Intended learning outcomes**

Execution of complex sequential experimental methods. Students gain an insight into new areas of research on the basis of current literature and knowledge transfer.

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

P (no information on SWS (weekly contact hours) and course language available)

**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 to 30 pages) or research proposal for thesis based on project (approx. 20 pages)

Language of assessment: English

**Allocation of places**

--

**Additional information**

--

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

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem Cell Biology</td>
<td>03-98-MVSZ-122-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institute of Medical Radiology and Cell Research (MSZ)</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>numerical grade</td>
<td>Only after succ. compl. of module(s)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
</tr>
</tbody>
</table>

**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 (no information on SWS (weekly contact hours) and course language available)

**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)

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

**Allocation of places**

--

**Additional information**

--

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

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems Biology B</td>
<td>07-MS-B-121-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holder of the Chair of Bioinformatics</td>
<td>Faculty of Biology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>(not) successfully completed</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

### Contents

Advances and current results of computational systems biology are explained and discussed, this includes results from functional genomics, dynamics of the transcriptome, of metabolism and metabolic networks as well as regulatory networks.

### Intended learning outcomes

Understand recent results in systems biology. Discuss their implications. Have an advanced (Master) level knowledge of typical technologies and research questions of systems biology.

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

V (no information on SWS (weekly contact hours) and course language available)

### 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)

Students will be informed about the method, length and scope of the assessment prior to the course. 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 (30 to 60 minutes)

### Allocation of places

--

### Additional information

--

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

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tissue Engineering / Functional Materials</td>
<td>03-98-MVTF-122-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holder of the Chair of Tissue Engineering (University Hospital)</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>numerical grade</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

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

V (no information on SWS (weekly contact hours) and course language available)

**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)

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

**Allocation of places**

--

**Additional information**

--

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

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virology 1 B</td>
<td>03-MV1-B-121-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holder of the Chair of Virology</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>(not) successfully completed</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**Contents**

This module will discuss contemporary topics in virology.

**Intended learning outcomes**

Students are able to understand current problems in virology and to discuss these in detail.

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

S (no information on language and number of weekly contact hours available)

**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)

#REF!

**Allocation of places**

--

**Additional information**

--

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

--
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virology 2 B</td>
<td>03-MV2-B-121-m01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holder of the Chair of Virology</td>
<td>Faculty of Medicine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>(not) successfully completed</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**Contents**
This module will discuss contemporary topics in virology.

**Intended learning outcomes**
Students are able to understand current problems in virology and to discuss these in detail.

**Courses** (type, number of weekly contact hours, language — if other than German)
S (no information on language and number of weekly contact hours available)

**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)

#REF!

**Allocation of places**
--

**Additional information**
--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)
--
### Module title
Knowledge Transfer / Tutoring

### Abbreviation
03-98-MTUT-122-m01

### Module coordinator
Dean of Studies Biomedizin (Biomedicine)

### Module offered by
Faculty of Medicine

### ECTS
2

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

### (not) successfully completed
--

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
Students work as tutors. They support other students, in particular in the context of courses and study planning, and they participate as assistants in the organisation and planning of exercises and lab courses.

### Intended learning outcomes
Tutors are able to communicate complex technical facts in a clear and structured way. They have gained experience in the supervision and motivation of groups, and they have practised applying conflict resolution strategies.

### Courses (type, number of weekly contact hours, language — if other than German)
P (no information on SWS (weekly contact hours) and course language available)

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

### Allocation of places
--

### Additional information
--

### Referred to in LPO I (examination regulations for teaching-degree programmes)
--
## Module title
Knowledge Transfer / Tutoring

## Abbreviation
03-98-MTUT3-122-m01

### Module coordinator
Dean of Studies Biomedizin (Biomedicine)

### Module offered by
Faculty of Medicine

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>(not) successfully completed</td>
<td>--</td>
</tr>
</tbody>
</table>

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

## Contents
Students work as tutors. They support other students, in particular in the context of courses and study planning, and they participate as assistants in the organisation and planning of exercises and lab courses.

## Intended learning outcomes
Tutors are able to communicate complex technical facts in a clear and structured way. They have gained experience in the supervision and motivation of groups, and they have practised applying conflict resolution strategies.

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of Weekly Contact Hours</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>(no information on SWS)</td>
<td>German</td>
</tr>
</tbody>
</table>

## 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)

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

## Allocation of places
--

## Additional information
--

## Referred to in LPO I (examination regulations for teaching-degree programmes)
--
### Module title
Cell- and Development-Biology Master 1 B

### Abbreviation
07-MZE1-B-121-m01

### Module coordinator
holder of the Chair of Cell Biology and Developmental Biology

### Module offered by
Faculty of Biology

### ECTS
3

### Method of grading
(only) successfully completed

### Only after succ. compl. of module(s)
--

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
The lecture *Zellpathologie* (*Cytopathology*) describes pathological states of the cell and unravels their biological causes and consequences, such as infection, apoptosis, senescence, metabolic disorders and cancer.

### Intended learning outcomes
Participants possess scientific background knowledge on cytopathology and are able to put this into the broader context of cell biology research.

### Courses
- V (no information on language and number of weekly contact hours available)

### 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)

#REF!

### Allocation of places
--

### Additional information
--

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

--
### Module title

**Cell- and Development-Biology Master 2 B**

| Abbreviation         | 07-MZE2-B-121-m01 |

### Module coordinator

holder of the Chair of Cell Biology and Developmental Biology

### Module offered by

Faculty of Biology

### ECTS

<table>
<thead>
<tr>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>(not) successfully completed</td>
</tr>
</tbody>
</table>

### Duration

<table>
<thead>
<tr>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
</tr>
</tbody>
</table>

### Contents

The lecture *Signale und Differenzierung (Signals and Differentiation)* is not designed to merely impart textbook knowledge to students. It will rather introduce students to particularly interesting and current topics in developmental biology. Topics covered in the lecture (subject to change):

- Cooperation: Development and consequences of multicellularity.
- On the move: Morphogenetic migration.
- All-rounders?: Opportunities and limitations of stem cell research.
- Growing new hearts?: Animals and their ability to regenerate.
- Disasters: What do we actually know about metamorphoses?
- Always the same?: Plasticity and epigenetics.
- Metaorganisms: We are never alone.
- Development in changing environments: Ecology and polyphenism.
- Developmental biology of behaviour: Everything is learned. Or isn't it?
- Evo-devo: A fad? No, been around for ages.

### Intended learning outcomes

Participants possess a knowledge of the theoretical and molecular biological principles underlying developmental biology and are able to put this into the broader context of cell and developmental biology research.

### Courses

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

V (no information on language and number of weekly contact hours available)

### 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)

#REF!

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--