Subdivided Module Catalogue
for the Subject
Biochemistry
as a Master’s with 1 major
with the degree "Master of Science"
(120 ECTS credits)

Examination regulations version: 2012
Responsible: Faculty of Chemistry and Pharmacy
Course of Studies - Contents and Objectives

No translation available.
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:

\[ \text{ASPO2009} \]

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

\[ \text{28-Aug-2012 (2012-151) except for mandatory elective 08-MCB-MSP-142 added in Fast Track procedure at a later time} \]

\[ \text{17-Dec-2014 (2014-87)} \]

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

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</table>
Module title | Bioinformatics
---|---
Abbreviation | 07-3A3BI-072-m01

Module coordinator | holder of the Chair of Bioinformatics
Module offered by | Faculty of Biology

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

Contents
Fundamental principles of bioinformatics.

Intended learning outcomes
Students are proficient in methods for the analysis of DNA and protein databases.

Courses (type, number of weekly contact hours, language — if other than German)
This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-3A3BI-1B-072: V (no information on SWS (weekly contact hours) and course language available)
- 07-3A3BI-2B-072: 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)
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

Assessment in module component 07-3A3BI-1B-072: Bioinformatics (Lecture)
- 1 ECTS, Method of grading: numerical grade
- written examination (approx. 20 minutes)

Assessment in module component 07-3A3BI-2B-072: Bioinformatics (Seminar)
- 1 ECTS, Method of grading: (not) successfully completed
- term paper (approx. 5 to 10 pages)

Allocation of places
Only as part of Biochemistry Master’s: 5 places. Places will be allocated by lot.
Additional information
--
Referred to in LPO I (examination regulations for teaching-degree programmes)
--
### Module Catalogue for the Subject
Biochemistry
Master's with 1 major, 120 ECTS credits

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<td>03-MTUB-092-m01</td>
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<td>holder of the Chair of Physiological Chemistry</td>
<td>Faculty of Medicine</td>
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<td>1 semester</td>
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### Contents
Practical introduction to model systems (cell culture, animal models) and experimental methods of molecular tumour research. Reading and presentation of original research articles.

### Intended learning outcomes
Students are familiar with tumour models and experimental techniques in molecular cancer research, and they are able to apply this knowledge in practice.

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

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<th>(no information on SWS (weekly contact hours) and course language available)</th>
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</table>

### Method of assessment
(No information on course type and language, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

- a) written examination (approx. 60 to 90 minutes) or b) log (approx. 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation (approx. 30 minutes). Students will be informed about the method and length of the assessment prior to the course.

- Assessment offered: once a year, winter semester

- Language of assessment: German, English

### Allocation of places
Number of places: 12. Selection process Biochemie (Biochemistry) Bachelor's: Should the number of applications exceed the number of available places, places will be allocated according to the following quotas: Quota 1 (two thirds of places): current average grade of successfully completed modules; among applicants with the same average grade, places will be allocated by lot. Quota 2 (one third of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available. Selection process Biochemie (Biochemistry) Master's: allocation by lot.

### Additional information

- Referred to in LPO I (examination regulations for teaching-degree programmes)
### Module title
Laboratory animal sciences

### Abbreviation
03-VTK-092-m01

### Module coordinator
Animal Welfare Officer of the University of Würzburg

### Module offered by
Faculty of Medicine

### ECTS
2

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

### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
Admission prerequisite to assessment: regular attendance of lab course as specified at the beginning of the course.

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

### Method of assessment
written examination (approx. 60 minutes)

### 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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<tr>
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<td>Faculty of Biology</td>
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<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
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<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.</td>
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**Contents**

The module will introduce students to the practice of bioinformatics and will cover the following topics: sequence analysis, structure analysis, genome analysis, cellular and metabolic networks as well as gene regulation.

**Intended learning outcomes**

Students are able to use appropriate bioinformatic algorithms to address simple problems as well as to interpret their results.

**Courses**

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

V + Ü (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. 10 to 20 pages)

Assessment offered: once a year, summer semester

Language of assessment: German or English

**Allocation of places**

Biochemie (Biochemistry) Bachelor’s: 4 places. Selection process Biochemie (Biochemistry) Bachelor’s: Should the number of applications exceed the number of available places, places will be allocated according to the following quotas: Quota 1 (two thirds of places): current average grade of successfully completed modules; among applicants with the same average grade, places will be allocated by lot. Quota 2 (one third of places) number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

**Additional information**

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

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## Module Catalogue for the Subject Biochemistry

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

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<td>Faculty of Biology</td>
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### Contents

This lecture provides a broad overview of biophysical techniques and their applications. The first part of the lecture discusses fundamental aspects of thermodynamics, kinetics and molecular interactions. The course then moves on to discuss biophysical methods that facilitate the investigation of individual cells down to the level of single molecules. Focus is on electromanipulation and dielectric spectroscopy of cells, biomembranes, electrophysiology, ion channels, protein folding, single-molecule fluorescence methods and high-resolution as well as dynamic microscopy.

### Intended learning outcomes

Students will have acquired a knowledge of fundamental biophysical methods and their applications that will enable them to independently review relevant literature. In addition, they will have become acquainted with - or, where necessary, will be able to independently acquaint themselves with - biophysical mechanisms.

### Courses

(V + S, 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)

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

Biochemistry Master's: 4 places. Places will be allocated by lot.

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Master's with 1 major Biochemistry (2012)
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<td>Bioinformatics (Lecture and Seminar)</td>
<td>07-MS2BI-102-m01</td>
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</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)

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)

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**

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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>Institute of Inorganic Chemistry</td>
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**Contents**

German contents available but not translated yet.

Das Modul führt in die Grundlagen der Bioanorganischen Chemie (BIC) ein. Es werden die Methoden der BIC, Struktur und Wirkungsweise Metall-haltiger Enzyme sowie Anwendungen der BIC als Diagnostika und Therapeutika behandelt.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**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) 1 to 3 written examinations (60 or 90 minutes) or b) oral examination of one candidate each (20 minutes) or c) oral examination in groups (groups of 2, 30 minutes). Should there be the option to choose between several methods of assessment, the module coordinator will choose the method to be used for the module component in the current semester at the beginning of the course.

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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

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<tr>
<td>lecturer of the seminar</td>
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**Contents**

German contents available but not translated yet.

Das Modul behandelt spezielle Themen der Naturstoffchemie und Biologischer Chemie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden können spezifische Themen der Naturstoffchemie und Biologischer Chemie erklären.

**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) 1 to 3 written examinations (60 or 90 minutes) or b) oral examination of one candidate each (20 minutes) or c) oral examination in groups (groups of 2, 30 minutes). Should there be the option to choose between several methods of assessment, the module coordinator will choose the method to be used for the module component in the current semester at the beginning of the course.

Language of assessment: German or English

**Allocation of places**

Chemistry Master's: no restrictions. Biochemistry Master's: 20 places. Places will be allocated by lot.

**Additional information**

--

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

--
Module title | Abbreviation
---|---
Organo- and Biocatalysis | 08-HKM1-102-m01

Module coordinator | Module offered by
lecturer of the seminar "Organo- and Biokatalyse" | Institute of Organic Chemistry

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Contents

German contents available but not translated yet.


Intended learning outcomes

German intended learning outcomes available but not translated yet.


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) 1 to 3 written examinations (60 or 90 minutes) or b) oral examination of one candidate each (20 minutes) or c) oral examination in groups (groups of 2, 30 minutes). Should there be the option to choose between several methods of assessment, the module coordinator will choose the method to be used for the module component in the current semester at the beginning of the course.

Language of assessment: German or English

Allocation of places

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Additional information

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

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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**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) 1 to 3 written examinations (60 or 90 minutes) or b) oral examination of one candidate each (20 minutes) or c) oral examination in groups (groups of 2, 30 minutes). Should there be the option to choose between several methods of assessment, the module coordinator will choose the method to be used for the module component in the current semester at the beginning of 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

**Principles of drug design**

### Abbreviation

08-MCM3-102-m01

## Module coordinator

lecturers Pharmazeutische Chemie (Pharmaceutical Chemistry)

## Module offered by

Institute of Pharmacy and Food Chemistry

## ECTS

5

## Method of grading

numerical grade

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

--

## Duration

1 semester

## Module level

graduate

## Other prerequisites

--

## Contents

German contents available but not translated yet.


## Intended learning outcomes

The student masters theoretical and experimental methods and aspects of drug design.

## Courses

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

## Method of assessment

presentation with discussion (approx. 30 minutes)

Language of assessment: German or English

## Allocation of places

Chemistry Master's and Mathematics Master's: no restrictions. Biochemistry Master's: 10 places. Places will be allocated by lot.

## Additional information

--

## Referred to in LPO 1

(examination regulations for teaching-degree programmes)

--
Module title          | Abbreviation
---|---
Clinical and Analytical Chemistry | 08-PH-KAC-092-m01

Module coordinator: lecturer of lecture "Klinisch-analytische Chemie" (Clinical and Analytical Chemistry)

Module offered by: Institute of Pharmacy and Food Chemistry

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

Duration: 1 semester

Module level: undergraduate

Other prerequisites: --

Contents:
This module covers specific topics of clinical analytical chemistry.

Intended learning outcomes:
German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über Fortgeschrittenkenntnisse der Molekularbiologie.

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

Method of assessment:
written examination (120 minutes)

Allocation of places:
--

Additional information:
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Referred to in LPO I: (examination regulations for teaching-degree programmes)
### Module title
Clinical and Analytical Chemistry (practical course)

### Abbreviation
08-PH-KACP-092-m01

### Module coordinator
Lecturer of lecture "Klinisch-analytische Chemie" (Clinical and Analytical Chemistry)

### Module offered by
Institute of Pharmacy and Food Chemistry

### ECTS
5

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

### Duration
1 semester

### Module level
Undergraduate

### Other prerequisites
--

### Contents
German contents available but not translated yet.

Das Modul behandelt praktische Themen der Klinischen Chemie sowie der Klinischen Diagnostik und die dazugehörigen analytischen Methoden.

### Intended learning outcomes
German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über Kenntnisse der Klinisch-analytischen Chemie und kann die Inhalte in praktischen Versuchen anwenden.

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

### Method of assessment
Examination talks (Testate, approx. 15 minutes each), log (approx. 5 to 10 pages)

### 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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**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 + 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)

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**

Biology Master's: no restrictions. Biochemistry Master's: 15 places. Places will be allocated by lot.

**Additional information**

--

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

--
Module title
Microbiology 2 (Lecture and Seminar)

Abbreviation
07-MS2M2-112-m01

Module coordinator
holder of the Chair of Microbiology

Module offered by
Faculty of Biology

ECTS
10

Method of grading
numerical grade

Only after succ. compl. of module(s)
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Duration
1 semester

Module level
graduate

Other prerequisites
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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 + 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)

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
Biology Master's: no restrictions. Biochemistry Master's: 15 places. Places will be allocated by lot.

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
**Presentation of Scientific Data**

**Module coordinator**
Coordinator BioCareers

**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**

Principles for the preparation of scientific manuscripts, citations and the presentation of scientific data. Students will write a scientific mini review and present this in a talk (15 minutes). Content, structure, coherence and the logical chain of arguments will be discussed. Students will write and publish (where possible) a scientific paper or review on a selected topic in a scientific journal. The students' work will be based on original papers as well as on reviews and will follow the instructions of a scientific journal of the students' choice. These instructions can be found on the website of the respective journal under "Instructions to Authors" or similar. Both length of chapters and structure of the article should be based on the style of the journal selected. Attendance of no less than 20 scientific talks (e.g. defences of doctoral theses, presentations of research projects, retreats) including presentations by guest speakers. Students are to obtain proof of attendance from the organisers or speakers.

**Intended learning outcomes**

The students are familiar with the details of publishing scientific data in written and oral form. They have become familiar with the methodology of scientific publishing in oral or written fashion. In addition, they have enhanced their English reading, speaking and writing skills.

**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)

Students will be informed about the 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**

Biology Master's: no restrictions. Biochemistry Master's: 10 places. Places will be allocated by lot.

**Additional information**

--

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

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Module title: Bacterial genetics - Infectiology
Abbreviation: 03-98-PBG-092-m01

Module coordinator: Institute of Molecular Infection Biology
Module offered by: Faculty of Medicine

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

Duration: 1 semester
Module level: undergraduate
Other prerequisites: Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.

Contents:
Foundations and analytical approaches of bacterial genetics are taught based on selected questions from molecular microbiology. Genetic processes are analysed with the help of examples of gene transfer. Molecular genetic and functional biochemical pathways are presented using examples from microbiology.

Intended learning outcomes:
Students have developed the ability to approach, analyse and interpret general problems in bacterial genetics based on individually assigned tasks, using techniques of modern molecular biology, microbiology and genetics. They also have developed skills in experimental design, bench work, data analysis and the presentation of scientific results both orally and in writing.

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

Method of assessment:
methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places:
Biochemistry Bachelor's: no restrictions. Biochemistry Master's: 4 places. Places will be allocated by lot.

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

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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  | Abbreviation
---|---
Cardiovascular Biology | 03-98-MVKB-122-m01

Module coordinator  | Module offered by
holder of the Chair of Experimental Biomedicine | Faculty of Medicine

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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 (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
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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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**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**

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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>Stem Cell Biology</td>
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**Module coordinator**

Institute of Medical Radiology and Cell Research (MSZ)  
Faculty of Medicine

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

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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>Tissue Engineering / Functional Materials</td>
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<td>Faculty of Medicine</td>
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</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**

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**Additional information**

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

--
### Module title
RNA worlds

### Abbreviation
08-MBC-RNAW-122-m01

### Module coordinator
holder of the Chair of Biochemistry

### Module offered by
Chair of Biochemistry

### ECTS
5

### Method of grading
numerical grade

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

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
The module imparts detailed and in-depth the current state of science in the field of research on RNA-protein complexes, their structure and function, as well as the theoretical basics of current RNA-based research methods.

### Intended learning outcomes
After participating in the module events, the student is familiar with the course contents and is able to transfer them to new scientific problems. He/She is able to classify new research results in the context of recent findings and to assess their significance.

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

### Method of assessment
(a) 1 to 3 written examinations (1 written examination: approx. 60 minutes; 2 written examinations: approx. 45 minutes each; 3 written examinations: approx. 40 minutes each) or (b) log (approx. 20 pages) or (c) oral examination of one candidate each (approx. 20 minutes) or (d) oral examination in groups of up to 3 candidates (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or (e) presentation/talk (approx. 15 to 30 minutes)

### 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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<td>Life cycle of proteins</td>
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### Contents

The module imparts detailed and in-depth the current state of science in the field of research on the regulation and control of the entire life cycle of proteins.

### Intended learning outcomes

After participating in the module events, the student is familiar with the course contents and is able to transfer them to new scientific problems. He/She is able to classify new research results in the context of recent findings and to assess their significance.

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

S + 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) 1 to 3 written examinations (1 written examination: approx. 60 minutes; 2 written examinations: approx. 45 minutes each; 3 written examinations: approx. 40 minutes each) or b) log (approx. 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or e) presentation/talk (approx. 15 to 30 minutes)

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)

--
### Module title
Genome stability

### Abbreviation
08-MBC-GST-122-m01

### Module coordinator
holder of the Chair of Biochemistry

### Module offered by
Chair of Biochemistry

### ECTS
5

### Method of grading
numerical grade

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

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
The module imparts detailed and in-depth the current state of science in the field of research on the stability of genomes in dependence of certain structural and epigenetic factors.

### Intended learning outcomes
After participating in the module events, the student is familiar with the course contents and is able to transfer them to new scientific problems. He/She is able to classify new research results in the context of recent findings and to assess their significance.

### Courses (type, number of weekly contact hours, language — if other than German)
S + 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) 1 to 3 written examinations (1 written examination: approx. 60 minutes; 2 written examinations: approx. 45 minutes each; 3 written examinations: approx. 40 minutes each) or b) log (approx. 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or e) presentation/talk (approx. 15 to 30 minutes)
Language of assessment: German or 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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### Contents

The module allows a deeper incorporation into the research methods and techniques in the field of investigation of RNA-protein complexes in a practical course.

### Intended learning outcomes

After completing the module, the student masters the techniques used in the practical course. He/She is able to explain and to critically reflect the performed experiments, and to both present and discuss the results in a written report.

### Courses

<table>
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### Method of assessment

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<td>a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)</td>
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Assessment offered: once a year

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: Protein quality control
Abbreviation: 08-MBC-PQK-122-m01

Module coordinator: holder of the Chair of Biochemistry
Module offered by: Chair of Biochemistry

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

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

Contents:
The module allows a deeper incorporation into the research methods and techniques in the field of protein degradation in eukaryotes in a practical course.

Intended learning outcomes:
After completing the module, the student masters the techniques used in the practical course. He/She is able to explain and to critically reflect the performed experiments, and to both present and discuss the results in a written report.

Courses:
Ü + 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) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)
Assessment offered: once a year
Language of assessment: German or English

Allocation of places:
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Additional information:
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### Contents

The module allows a deeper incorporation into the research methods and techniques in the field of investigation of epigenetic modifications, DNA structures, and genome stability in a practical course.

### Intended learning outcomes

After completing the module, the student masters the techniques used in the practical course. He/She is able to explain and to critically reflect the performed experiments, and to both present and discuss the results in a written report.

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

Ü + 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) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)

Assessment offered: once a year

Language of assessment: German or English

### Allocation of places

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### Additional information

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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende erwirbt ein Grundverständnis für die Herangehensweise bei der Wahl von Proteinkonstrukten für die Kristallisation. Er/Sie beherrscht nach Besuch der Modulveranstaltungen die theoretischen Grundlagen sowie die grundlegenden Fertigkeiten und Techniken der Proteinkristallisation und Datensammlung/-verarbeitung und kann die Ergebnisse dokumentieren und reflektierend diskutieren.

**Courses**

(V + Ü + 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)

- 1 to 3 written examinations (1 written examination: approx. 60 minutes; 2 written examinations: approx. 45 minutes each; 3 written examinations: approx. 40 minutes each) or
- b) log (approx. 20 pages) or
- c) oral examination of one candidate each (approx. 20 minutes) or
- d) oral examination in groups of up to 3 candidates (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or
- e) presentation/talk (approx. 15 to 30 minutes)

Assessment offered: once a year

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)

--
### Module title
Molecular Biology for Biochemistry students

### Abbreviation
08-BC-MOL-122-m01

### Module coordinator
holder of the Chair of Biochemistry

### Module offered by
Chair of Biochemistry

### ECTS
6

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
o8-BC (module component 08-BC-1 only)

### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
--

### Contents
The module covers specific topics of molecular physiology and functional biochemistry in lectures and exercises. An additional lecture conveys the subject field of genetic engineering and biosafety.

### Intended learning outcomes
After attending the module events, students have sound knowledge in molecular biology. The students know the necessary infrastructure and usage rules for the different security levels of genetic engineering facilities. They have mastered the basics of genetic engineering in theory and are able to describe relevant examples of the use of gene technology and to explain the associated safety issues.

### Courses
This module comprises 2 module components. Information on courses will be listed separately for each module component.

- **03-GTBS-1-092**: V (no information on SWS (weekly contact hours) and course language available)
- **08-BC-MOL-1-122**: V + Ü (no information on SWS (weekly contact hours) and course language available)

### Method of assessment
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

**Assessment in module component 03-GTBS-1-092: Genetic Engineering and Biosafety**
- 1 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 30 minutes)

**Assessment in module component 08-BC-MOL-1-122: Molecular Biology Molecular Biology**
- 5 ECTS, Method of grading: numerical grade
- a) written examination (approx. 60 to 90 minutes) or b) log (approx. 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation (approx. 30 minutes). Students will be informed about the method and length of the assessment prior to the course.
- Language of assessment: German or English

### Allocation of places
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### Additional information
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**Duration**

- 1 semester

**Contents**

German contents available but not translated yet.

Das Modul beschäftigt sich in Vorträgen der Teilnehmer/-innen mit einem vorher mit dem/der Verantwortlichen abzusprechenden Thema der Lebenswissenschaften. Gegenstand der Vorträge sind dabei relevante Veröffentlichungen im jeweiligen Forschungs-Gebiet, die anschließend kritisch diskutiert werden.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**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)

- presentation/talk (approx. 15 to 30 minutes)
  - Language of assessment: German or English

**Allocation of places**

--

**Additional information**

--

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

--
### Contemporary Biochemical Methods

**Module title** | **Abbreviation**  
--- | ---  
Contemporary Biochemical Methods | 08-AMB-122-m01  

**Module coordinator**  
holder of the Chair of Biochemistry

**Module offered by**  
Chair of Biochemistry

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

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

### Contents

German contents available but not translated yet.

Das Modul stellt im Rahmen einer Vorlesungsreihe aktuellste Entwicklungen in der biochemischen Forschungsmethodik vor. Ausgewiesene Spezialisten stellen dabei die von Ihnen verwendeten Methoden und deren theoretischen Grundlagen detailliert und vertieft dar.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

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

### Method of assessment

1 to 3 written examinations (1 written examination: approx. 60 minutes; 2 written examinations: approx. 45 minutes each; 3 written examinations: approx. 40 minutes each)

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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### Contents
This module will discuss current topics in human genetics.

### Intended learning outcomes
Students have developed the ability to understand relevant questions in human genetics and to discuss these in detail.

### 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)
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
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### Additional information
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**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)

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**

Biochemistry Master's: 3 places. Places will be allocated by lot.

**Additional information**

--

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

--
### Module Catalogue for the Subject

**Biochemistry**

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

<table>
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### 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)

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)

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

Biochemistry Master's: 3 places. Places will be allocated by lot.

### Additional information

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### Referred to in LPO 1

(examination regulations for teaching-degree programmes)

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### 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

V + S (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

Biochemistry Master's: 3 places. Places will be allocated by lot.

### Additional information

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### Referred to in LPO I

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**Module coordinator**  
holder of the Chair of Virology

**Module offered by**  
Faculty of Medicine

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**Duration**  
1 semester

**Module level**  
graduate

**Other prerequisites**  
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**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**  
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)

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**  
Biochemistry Master's: 3 places. Places will be allocated by lot.

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

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Module title | Abbreviation
--- | ---
Literature seminar 2 | 08-MBC-LIT2-122-m01

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Contents

German contents available but not translated yet.

Das Modul beschäftigt sich in Vorträgen der Teilnehmer/-innen mit einem vorher mit dem/der Verantwortlichen abzusprechenden Thema der Lebenswissenschaften. Gegenstand der Vorträge sind dabei relevante Veröffentlichungen im jeweiligen Forschungs-Gebiet, die anschließend kritisch diskutiert werden.

Intended learning outcomes

German intended learning outcomes available but not translated yet.


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)

presentation/talk (approx. 15 to 30 minutes)

Language of assessment: German or English

Allocation of places

--

Additional information

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

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**Contents**

In the course of the module current results of local, national or international research groups are presented in a lecture series. The methods are described and the results are integrated into the context of current literature.

**Intended learning outcomes**

After attending the module events, students have knowledge of the current progress of biochemical research. They can understand the discussed issues and summarize and reflect the contents in a short talk.

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

S + 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)

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

**Allocation of places**

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**Additional information**

--

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

--
### Module title
Contemporary Research in Biochemistry M2

### Abbreviation
08-MBC-AFB2-122-m01

### Module coordinator
holder of the Chair of Biochemistry

### Module offered by
Chair of Biochemistry

### ECTS
3

### Method of grading
numerical grade

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

### Duration
2 semester

### Module level
graduate

### Other prerequisites
--

### Contents
In the course of the module current results of local, national or international research groups are presented in a lecture series. The methods are described and the results are integrated into the context of current literature.

### Intended learning outcomes
After attending the module events, students have knowledge of the current progress of biochemical research. They can understand the discussed issues and summarize and reflect the contents in a short talk.

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

### Method of assessment
presentation/talk (approx. 15 to 30 minutes)
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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### Contents

The module offers the opportunity to learn correct presenting and mediating scientific questions by giving a tutorial attendant to a lecture at the faculty of chemistry and pharmacy.

### Intended learning outcomes

The students are able to adequately prepare and present scientific questions, and to guide students in lower semesters.

### Courses

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

T (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)

preparing and supervising study groups: assessment to be successfully completed (type and length of assessment to be specified at the beginning of the course)

Language of assessment: German or English

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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**Contents**

The module offers the possibility to learn the organization, training and responsible leadership of scientific experiments by assisting undergraduate students in a practical course.

**Intended learning outcomes**

The student is able to train and to supervise undergraduate students in basic experimental procedures.

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

Ü (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)

preparing and supervising student lab courses: assessment to be successfully completed (type and length of assessment to be specified at the beginning of the course)
Language of assessment: German or English

**Allocation of places**

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**Additional information**

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

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**Contents**

German contents available but not translated yet.

Das Modul behandelt biologisch wichtige Verbindungsklassen, deren Reaktionen und Synthesen, den Umgang mit besonderen Gefahrstoffen, anspruchsvollere Arbeits- und Synthesetechniken, Reinigungsmethoden und Produktanalytik.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

V + Ü (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) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)

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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### Contents

The internship is carried out at universities abroad and can be embedded within offered study programs (eg Erasmus). The content requirements should comply with those of the electives of the Biochemistry Master program at the University of Würzburg (what has to be ascertained in advance under discussion with the module coordinator).

### Intended learning outcomes

The students are familiar with working methods at universities abroad. Besides professional competences they have also acquired language and social skills.

### 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)

a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)

Language of assessment: German or English

### Allocation of places

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### Additional information

Additional information on module duration: block lab course with a minimum duration of 15 weeks.

### Referred to in LPO I

(examination regulations for teaching-degree programmes)
Module title | Abbreviation
--- | ---
Practical course - abroad 2 | 08-MBC-AP2-122-m01

Module coordinator

chairperson of examination committee Biochemie (Biochemistry)

Module offered by

Chair of Biochemistry

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

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

Contents

The internship is carried out at universities abroad and can be embedded within offered study programs (e.g., Erasmus). The content requirements should comply with those of the electives of the Biochemistry Master program at the University of Würzburg (what has to be ascertained in advance under discussion with the module coordinator).

Intended learning outcomes

The students are familiar with working methods at universities abroad. Besides professional competences they have also acquired language and social skills.

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)

a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)

Language of assessment: German or English

Allocation of places

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Additional information

Additional information on module duration: block lab course with a minimum duration of 8 weeks.

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

--
Module title
Practical course - external 1

Abbreviation
08-MBC-EP1-122-m01

Module coordinator
chairperson of examination committee Biochemie (Biochemistry)

Module offered by
Chair of Biochemistry

ECTS
15

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

(not) successfully completed
--

Duration
1 semester

Module level
graduate

Other prerequisites
--

Contents
German contents available but not translated yet.

Das Praktikum wird außerhalb der Universität in einer außeruniversitären Forschungs-/Diagnostikeinrichtung oder als Betriebspraktikum in einer Firma durchgeführt. Die Inhalte des Praktikums werden von der jeweiligen Einrichtung bestimmt. Die inhaltlichen Anforderungen sollen denen eines im Bachelor Studiengang Biochemie (180 ECTS) angebotenen Praktikums entsprechen, was im Vorfeld mit dem Verantwortlichen abzusprechen ist.

Intended learning outcomes
Students are acquainted with the structures of non-university institutions and possess specific professional skills.

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)

a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)

Language of assessment: German or English

Allocation of places
--

Additional information
Additional information on module duration: block lab course with a minimum duration of 8 weeks.

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

Chairperson of examination committee Biochemie (Biochemistry)

**Module offered by**

Chair of Biochemistry

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**Contents**

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Das Praktikum wird außerhalb der Universität in einer außeruniversitären Forschungs-/Diagnostikeinrichtung oder als Betriebspraktikum in einer Firma durchgeführt. Die Inhalte des Praktikums werden von der jeweiligen Einrichtung bestimmt. Die inhaltlichen Anforderungen sollen denen eines im Bachelor Studiengang Biochemie (180 ECTS) angebotenen Praktikums entsprechen, was im Vorfeld mit dem Verantwortlichen abzusprechen ist.

**Intended learning outcomes**

Students are acquainted with the structures of non-university institutions and possess specific professional skills.

**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)**

a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

Additional information on module duration: block lab course with a minimum duration of 8 weeks.

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

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**Contents**

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**Intended learning outcomes**

After attending the lab course, the student has advanced methodological knowledge. He/She is able to transfer the methods used in this course on other issues and to assess their applicability. He/She is trained in scientifically correct documentation and discussion of experimentation and results.

**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)

a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)

Language of assessment: German or English

**Allocation of places**

--

**Additional information**

Additional information on module duration: block lab course with a minimum duration of 8 weeks.

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

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### Module Catalogue for the Subject Biochemistry

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

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**ECTS**

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### Intended learning outcomes

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### Courses

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### Method of assessment

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Language of assessment: German or English

### Allocation of places

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### Additional information

Additional information on module duration: block lab course with a minimum duration of 8 weeks.

### Referred to in LPO I

(examination regulations for teaching-degree programmes)
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**Intended learning outcomes**

After attending the lab course, the student has advanced methodological knowledge. He/She is able to transfer the methods used in this course on other issues and to assess their applicability. He/She is trained in scientifically correct documentation and discussion of experimentation and results.

**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)

a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

Additional information on module duration: block lab course with a minimum duration of 6 weeks.

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

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The lab course is carried out in a working group with biochemical and/or molecular biology research orientation at the University of Würzburg. The contents of the lab course have to be defined in advance in consultation with the module responsible. The lab course allows intensive training in biochemistry, molecular biology and/or bioinformatics research methods. The experiments and their results are documented in a written protocol.

### Intended learning outcomes

After attending the lab course, the student has advanced methodological knowledge. He/She is able to transfer the methods used in this course on other issues and to assess their applicability. He/She is trained in scientifically correct documentation and discussion of experimentation and results.

### 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)

a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)

Language of assessment: German or English

### Allocation of places

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### Additional information

Additional information on module duration: block lab course with a minimum duration of 6 weeks.

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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**Contents**

The lab course is carried out in a working group with biochemical and / or molecular biology research orientation at the University of Würzburg. The contents of the lab course have to be defined in advance in consultation with the module responsible. The lab course allows intensive training in biochemistry, molecular biology and / or bioinformatics research methods. The experiments and their results are documented in a written protocol.

**Intended learning outcomes**

After attending the lab course, the student has advanced methodological knowledge. He/She is able to transfer the methods used in this course on other issues and to assess their applicability. He/She is trained in scientifically correct documentation and discussion of experimentation and results.

**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)

a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)

Language of assessment: German or English

**Allocation of places**

--

**Additional information**

Additional information on module duration: block lab course with a minimum duration of 3 weeks.

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

--
Module title | Practical lab course 6
---|---
Abbreviation | 08-MBC-LP6-122-m01

Module coordinator | chairperson of examination committee Biochemie (Biochemistry)
---|---
Module offered by | Chair of Biochemistry

ECTS | 5
Method of grading | Only after succ. compl. of module(s)
(not) successfully completed | --
Duration | 1 semester
Module level | graduate
Other prerequisites | --

Contents
The lab course is carried out in a working group with biochemical and/or molecular biology research orientation at the University of Würzburg. The contents of the lab course have to be defined in advance in consultation with the module responsible. The lab course allows intensive training in biochemistry, molecular biology and/or bioinformatics research methods. The experiments and their results are documented in a written protocol.

Intended learning outcomes
After attending the lab course, the student has advanced methodological knowledge. He/She is able to transfer the methods used in this course on other issues and to assess their applicability. He/She is trained in scientifically correct documentation and discussion of experimentation and results.

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)
a) log (approx. 20 pages) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) presentation/talk (approx. 15 to 30 minutes)
Language of assessment: German or English

Allocation of places
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Additional information
Additional information on module duration: block lab course with a minimum duration of 3 weeks.

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

The module offers the opportunity to learn correct presenting and mediating scientific questions by giving a tutorial attendant to a lecture at the faculty of chemistry and pharmacy.

**Intended learning outcomes**

The students are able to adequately prepare and present scientific questions, and to guide students in lower semesters.

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

T (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)

preparing and supervising study groups: assessment to be successfully completed (type and length of assessment to be specified at the beginning of the course)

Language of assessment: German or English

**Allocation of places**

--

**Additional information**

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

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Module title: Assistance in practical courses 2
Abbreviation: 08-MBC-AWA2-122-m01

Module coordinator:
chairperson of examination committee Biochemie (Biochemistry)

Module offered by:
Chair of Biochemistry

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

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

Contents:
The module offers the possibility to learn the organization, training and responsible leadership of scientific experiments by assisting undergraduate students in a practical course.

Intended learning outcomes:
The student is able to train and to supervise undergraduate students in basic experimental procedures.

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

Method of assessment:
preparing and supervising student lab courses: assessment to be successfully completed (type and length of assessment to be specified at the beginning of 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
Final Examination in Biochemistry

### Abbreviation
08-MBC-MA-122-m01

### Module coordinator
Chairperson of examination committee Biochemistry (Biochemistry)

### Module offered by
Chair of Biochemistry

### ECTS
30

### Method of grading
Numerical grade

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

### Duration
1 semester

### Module level
Graduate

### Other prerequisites
--

### Contents
The module enables the processing of a defined problem within a specified period by applying the scientific methods learned in the course of study. The results will be defended in a final colloquium.

### Intended learning outcomes
German intended learning outcomes available but not translated yet.


### Courses (type, number of weekly contact hours, language — if other than German)
This module has 2 components; information on courses listed separately for each component.

- 08-MBC-MA-2-122: K (no information on language and number of weekly contact hours available)
- 08-MBC-MA-1-122: A (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)
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 08-MBC-MA-2-122: Abschlusskolloquium**
- 5 ECTS credits, method of grading: numerical grade
- Abschlusskolloquium (approx. 45 minutes)
- Language of assessment: German or English

**Assessment component to module component 08-MBC-MA-1-122: Master-Arbeit**
- 25 ECTS credits, method of grading: numerical grade
- Written thesis (approx. 60 pages)
- 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

Mass-Spectrometry and Proteomics

### Abbreviation

08-MBC-MSP-142-m01

### Module coordinator

holder of the Chair of Biochemistry

### Module offered by

Chair of Biochemistry

### ECTS

5

### Method of grading

only after succ. compl. of module(s)

### Duration

1 semester

### Module level

graduate

### Other prerequisites

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### Contents

German contents available but not translated yet.


### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Nach Teilnahme an den Modulveranstaltungen beherrschen die Studierenden auf breiter Basis die theoretischen Grundlagen massenspektrometrischer Protei- und Proteomanalysen sowie den Umgang mit relevanter Datenanalyse-Software. Sie kennen und beherrschen die Arbeitsschritte von der Probenvorbereitung bis zur massenspektrometrischen Proteinanalyse und haben Einblick in die Bedienung eines nanoHPLC-gekoppelten Massenspektrometers.

### Courses

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

**Type of course:**

V + S + P

**Number of weekly contact hours:**

no information available

**Language:**

German

### Method of assessment

(a) written examination (approx. 60 minutes) or Biochemie (Biochemistry): b) log (approx. 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or e) presentation/talk (approx. 15 to 30 minutes)

**Language of assessment:**

German, English

### Allocation of places

Biochemistry Master's: 6 places. Places will be allocated by lot.

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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