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

Examination regulations version: 2013
Responsible: Faculty of Chemistry and Pharmacy
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### The subject is divided into

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Content and Objectives of the Programme

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:

**ASPO2009**

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

**23-Sep-2013 (2013-110) except for mandatory electives added in Fast Track procedure at a later time**

**9-Dec-2014 (2014-81)**

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

Abbreviation
03:451/MM-BC-132-m01

Module coordinator
holder of the Professorship of Immunogenetics

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
--

Contents
This module gives an introduction to immunology. The following questions will be addressed: How does the body recognise and eliminate pathogens and tumour cells? How can the immune system damage its own body (allergies, autoimmunity)? Organs, cells and molecules of the immune system will be presented with an emphasis on genetic and molecular mechanisms of recognition and elimination of foreign substances by the immune system. The most important immunological techniques will be introduced and applied.

Intended learning outcomes
The students acquire a practical knowledge of cellular and molecular techniques for the analysis of the immune system. They are familiar with the mechanisms of self and non-self discrimination by the adaptive and innate immune systems. They acquire a fundamental knowledge of lymphocyte development as well as major immune effector cell functions and molecules.

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

Method of assessment
written examination (approx. 45 minutes)
Assessment offered: once a year, summer semester
Language of assessment: German or English

Allocation of places
Biochemie (Biochemistry) Bachelor’s: 16 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 title**  
Virology for students of biochemistry

**Abbreviation**  
03.4S1VIR-BC-132-m01

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

**Module offered by**  
Faculty of Medicine

**ECTS**  
5

**Method of grading**  
--

**Duration**  
1 semester

**Module level**  
undergraduate

**Other prerequisites**  
--

**Contents**

Introduction to virology; the infectious cycle; virus structure and assembly; adsorption and entry; genomes and genetics; RNA-viruses: mRNA-synthesis and RNA-genome replication; retroviruses: reverse transcription and integration; DNA-viruses: transcription and genome replication. Foundations of cell biology. Introduction to the scientific method and scientific approach; principles of antiviral therapy and vaccination; introduction to clinical virology; HIV and AIDS. Safe work in a BSL-2 laboratory; cell culture; virus production, titre test; virus sequencing, phylogenetic analysis of viral quasispecies.

**Intended learning outcomes**

Fundamental knowledge of molecular virology, the structure and replication of viruses and virus-host interactions; principles of antiviral vaccines and chemotherapeutics; principal techniques in cell and molecular biology for virological research.

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

**Method of assessment**  
(type, scope, language — if other than German)

a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes) or f) practical examination (on average approx. 2 hours; time to complete varies according to subject area but will not exceed a maximum of 4 hours). Students will be informed about the method and length of the assessment prior to the course.

Assessment offered: once a year, summer semester

Language of assessment: German or English

**Allocation of places**

Biochemie (Biochemistry) Bachelor’s: 18 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)

--
### Human genetics for students of biochemistry

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<thead>
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<tr>
<td>Human genetics for students of biochemistry</td>
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<tbody>
<tr>
<td>holder of the Chair of of Human Genetics</td>
<td>Faculty of Medicine</td>
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<th>Module level</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

### Contents

Fundamentals of and analytical methods in human and vertebrate cytogenetics. Characterisation of the normal human karyotype and chromosome aberrations. Introduction to chromosome evolution.

### Intended learning outcomes

Students who complete this module will acquire the theoretical basis of and practical experience in human cytogenetics. They will learn how to prepare and identify human chromosomes and critically interpret cytogenetic findings.

### Courses

<table>
<thead>
<tr>
<th>Type</th>
<th>Weekly contact hours</th>
<th>Language</th>
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<tbody>
<tr>
<td>V + Ü + S</td>
<td>no information on SWS</td>
<td></td>
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</table>

### Method of assessment

written examination (approx. 30 minutes)

### Allocation of places

Biochemie (Biochemistry) Bachelor’s: 5 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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<table>
<thead>
<tr>
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<th>Abbreviation</th>
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<td>Pathobiochemistry</td>
<td>03-PBC-132-m01</td>
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<th>Module offered by</th>
</tr>
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<tbody>
<tr>
<td>holder of the Chair of Clinical Biochemistry and Pathobiochemistry</td>
<td>Faculty of Medicine</td>
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<th>Other prerequisites</th>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

### Contents

Fundamentals of selected topics in pathobiochemistry and pathophysiology.

### Intended learning outcomes

Students are familiar with the fundamentals of pathobiochemistry and pathophysiology.

### Courses

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

- 03-PBC-1-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 03-PBC-2-132: P (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-PBC-1-092: Basics in Pathobiochemistry

- 2 ECTS, Method of grading: numerical grade
- written examination (approx. 90 minutes)
- Language of assessment: German or English

#### Assessment in module component 03-PBC-2-132: Pathobiochemistry Practical Course

- 3 ECTS, Method of grading: (not) successfully completed
- assessment of practical performance, Nachtestate (post-experiment exams: examination talks, approx. 15 minutes each), logs (approx. 20 pages)
- Assessment offered: once a year, summer semester
- Language of assessment: German or English

### Allocation of places

Information on the allocation of places will be listed separately for each module component.

- 03-PBC-2-132: Biochemie (Biochemistry) Bachelor’s: 6 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)
## Molecular Biology Lab

**Abbreviation:** 08-BC-MOLP-111-m01

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

**Module offered by:** Chair of Biochemistry

**ECTS:** 10

**Method of grading:** numerical grade

**Duration:** 1 semester

**Module level:** undergraduate

**Other prerequisites:** --

### Contents

The module provides practical skills in the fields of recombinant engineering and characterization of macromolecular complexes, current biomolecular techniques, analysis of biochemical processes in vivo, and up-to-date imaging techniques.

### Intended learning outcomes

The student has knowledge of molecular biology and is able to apply the contents in practical experiments.

### Courses

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of weekly contact hours</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ü</td>
<td>(no information on SWS)</td>
<td>(weekly contact hours) and course language available</td>
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### Method of assessment

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 or English

### Allocation of places

Biochemie (Biochemistry) Bachelor’s: 24 places. Chemie (Chemistry) Master’s: 6 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.

Selection process Chemie (Chemistry) Master’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): grade of module 08-BC; among applicants with the same 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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<tr>
<th>Module title</th>
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<td>Cell biology</td>
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</table>

**Module coordinator**
holder of the Chair of Medical Radiation and Cell Research

**Module offered by**
Faculty of Medicine

**ECTS** | **Method of grading** | **Only after succ. compl. of module(s)**
---|---|---
5 | numerical grade | 08-BC (module component 08-BC-1 only)

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

**Contents**
Becoming familiar with basic cell biological principles via hands-on training and seminars. Major topics are the structural organisation of eukaryotic cells, cell-cell and cell-matrix interactions, proliferation, differentiation and apoptosis.

**Intended learning outcomes**
Problem-oriented handling of eukaryotic cells under sterile conditions and understanding of principles of techniques for the analysis of cells. Understanding the molecular basis of cell biology and cellular malfunctions and their significance for disease development. Independent extraction of relevant information and presentation of selected examples of current literature.

**Courses**
(type, number of weekly contact hours, language — if other than German)
P + 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 is creditable for bonus)
written examination (approx. 60 minutes)
Language of assessment: German or English

**Allocation of places**
Biochemie (Biochemistry) Bachelor’s: 12 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)
--
### Module title
Molecular Tumor Biology

### Abbreviation
03-MTUB-132-m01

### Module coordinator
holder of the Chair of Physiological Chemistry

### Module offered by
Faculty of Medicine

### ECTS
5

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

### Module level
undergraduate

### Other prerequisites
--

### Duration
1 semester

### Contents
Practical introduction to model systems (cell culture, animal models) and experimental methods of molecular tumor 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)

### Method of assessment
(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 or English

### Allocation of places
Biochemie (Biochemistry) Bachelor's: 12 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)

--
### Module title

**Specific Microbiology 2 for Students of Biochemistry**

### Abbreviation

07-5S2MiZ2-BC-132-m01

### Module coordinator

holder of the Chair of Microbiology

### Module offered by

Faculty of Biology

### ECTS

10

### Method of grading

Only after succ. compl. of module(s)

### Numerical grade

--

### Duration

1 semester

### Module level

undergraduate

### Other prerequisites

--

### Contents

In this module, students will acquire an in-depth insight into approaches and methods in microbiology.

### Intended learning outcomes

Students have acquired knowledge about general strategies and methods of microbiology. They are able to independently perform scientific laboratory work.

### Courses

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

### Method of assessment

a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes) or f) practical examination (on average approx. 2 hours; time to complete varies according to subject area but will not exceed a maximum of 4 hours). Students will be informed about the method and length of the assessment prior to the course.

### Allocation of places

Biochemie (Biochemistry) Bachelor’s: 6 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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<table>
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<th>Abbreviation</th>
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<td>Organic Chemistry 4</td>
<td>08-OC4-102-m01</td>
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<tbody>
<tr>
<td>holder of the Chair of Organic Chemistry II</td>
<td>Institute of Organic Chemistry</td>
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<td>10</td>
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<thead>
<tr>
<th>Duration</th>
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<th>Other prerequisites</th>
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<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>By way of exception, additional prerequisites are listed in the section on assessments.</td>
</tr>
</tbody>
</table>

### Contents

German contents available but not translated yet.

Das Modul behandelt im Schwerpunkt Heterocyclen, Farbstoffe, Naturstoffe, Biopolymere und Schutzgruppentechniken. Das Modul vertieft die experimentellen Fertigkeiten der Studierenden durch den Umgang mit besonderen Gefahrenstoffen, komplizierte Arbeits- und Synthesetechniken, umfangreiche Reinigungsmethoden sowie aufwendige Produktanalysen.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

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

- 08-OC4-1-102: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 08-OC4-2-102: P (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 08-OC4-1-102: Organic Chemistry 4

- 5 ECTS, Method of grading: numerical grade
- 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
- Only after successful completion of module components: 08-OC1 or 08-OC1-GHR
- Other prerequisites: Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).

#### Assessment in module component 08-OC4-2-102: Organic Chemistry - advanced laboratory course for students of chemistry

- 5 ECTS, Method of grading: (not) successfully completed
- pre/post-experiment examination talks (Vor-/Nachtestate, approx. 15 minutes each), log (approx. 5 to 10 pages)
- Assessment offered: once a year, winter semester
- Language of assessment: German, English
- Only after successful completion of module components: 08-OC3 (module component 08-OC3-2 only) or 08-OC3P

**Allocation of places**

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**Additional information**

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

§ 62 (1) 2. Chemie "Organische und Bioorganische Chemie"
<table>
<thead>
<tr>
<th><strong>Module title</strong></th>
<th><strong>Abbreviation</strong></th>
</tr>
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<tbody>
<tr>
<td>Bioinformatics for Advanced Students in Biochemistry</td>
<td>07-4BFMZ4-BC-132-m01</td>
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<tbody>
<tr>
<td>holder of the Chair of Bioinformatics</td>
<td>Faculty of Biology</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

**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**

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

**Method of assessment**

(log (approx. 10 to 20 pages)

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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<table>
<thead>
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<td>Advanced lab (abridged)</td>
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<tbody>
<tr>
<td>chairperson of examination committee Biochemie (Biochemistry)</td>
<td>Chair of Biochemistry</td>
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<table>
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<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

### Contents
Delved practice in a specific research topic; presentation of the results in a written protocol.

### Intended learning outcomes
The student is able to deeply acquaint himself/herself with a specific research topic, and to present the results in a written protocol.

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

### Method of assessment
(No information on examination offered — If not every semester, information on whether module is creditable for bonus)

log (approx. 20 pages)
Language of assessment: German or English

### Allocation of places
--

### Additional information
Additional information on module duration: 3 weeks.

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

<table>
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<tbody>
<tr>
<td>Advanced lab</td>
<td>08-AVP10-BC-132-m01</td>
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### Module coordinator
Chairperson of examination committee Biochemie (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
Undergraduate

### Other prerequisites
--

### Contents
Delved practice in a specific research topic; presentation of the results in a written protocol.

### Intended learning outcomes
The student is able to deeply acquaint himself/herself with a specific research topic, and to present the results in a written protocol.

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

### Method of assessment
Log (approx. 30 pages)

Language of assessment: German or English

### Allocation of places
--

### Additional information
Additional information on module duration: 6 weeks.

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

--
# Module Catalogue for the Subject Biochemistry

## Bachelor's with 1 major, 180 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<td>Introductory Neurobiology for students of biomedicine</td>
<td>03-98-PGN-092-m01</td>
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<tr>
<td>holder of the Chair of Clinical Neurobiology</td>
<td>Faculty of Medicine</td>
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<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.</td>
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</table>

## Contents

General fundamentals of neuroanatomy, important methods in neurobiology, diseases of the nervous system: symptoms, diagnosis, therapeutic options, discussion of novel research results.

## Intended learning outcomes

Students who successfully completed this module have acquired a fundamental knowledge about the structure and function of the nervous system. Giving oral presentations, they have developed the ability to critically reflect and discuss current scientific research results in the context of the field of neurobiology.

## 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

--

## Additional information

--

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

--
Module title | Abbreviation
---|---
Current Methods of Protein Chromatography | 08-BC-AMP-141-m01

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

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

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

Contents
In practical experiments the module provides the theoretical foundations and methodological skills in the purification of various proteins by modern chromatographic methods.

Intended learning outcomes
After attending the module, the students know the equipment necessary for chromatographic protein purifications. They know the various relevant parameters and are able to transfer their knowledge to other questions. They are able to evaluate the results and to document and discuss them in a protocol.

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 is creditable for 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 or English

Allocation of places
Biochemie (Biochemistry) Bachelor’s: 24 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
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Compulsory Courses
(118 ECTS credits)
### Module title

**Structural Biology**

### Abbreviation

03-5S2ST-BC-132-m01

### Module coordinator

holder of the Chair of Structural Biology

### Module offered by

Faculty of Medicine

### ECTS

10

### Method of grading

Only after succ. compl. of module(s)

### Module level

undergraduate

### Other prerequisites

--

### Contents

This module provides a brief introduction to crystallography and commonly used biophysical techniques as well as the fundamental principles of macromolecular architectures. Building on this, the structure and function of selected biological macromolecules are presented. In small groups, participants will analyse one specific macromolecule in silico with respect to its structure and biological function and will present their results in a talk. The various macromolecules in their entirety reflect a number of important biological problems.

### Intended learning outcomes

On the basis of individually assigned model proteins, the students will acquire the ability to explore common problems in structural biology and to analyse structure-function relationships. They will also acquire skills in the oral presentation of scientific results as well as in the in silico analysis of biological macromolecules.

### Courses

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

### Method of assessment

(a) written examination (approx. 45 to 60 minutes) or (b) log (approx. 10 to 20 pages) or (c) oral examination of one candidate each (approx. 30 minutes) or (d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or (e) presentation (approx. 20 to 30 minutes) or (f) practical examination (on average approx. 2 hours; time to complete varies according to subject area but will not exceed a maximum of 4 hours). 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

--

### Additional information

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### Referred to in LPO 1

(examination regulations for teaching-degree programmes)
General Biology for students of biochemistry  
07-1A1ZO-BC-132-m01

Module coordinator  
Dean of Studies Biologie (Biology)

Module offered by  
Faculty of Biology

ECTS  
5

Method of grading  
Numerical grade

Duration  
1 semester

Module level  
Undergraduate

Other prerequisites  
- 

Contents

The first part of the course will acquaint students with the elementary building blocks of life as well as biological categories. Building on this knowledge, the course will then discuss the cell, the smallest unit of life, starting with its macroscopic structure before moving on to its microscopic structure. The course will point out differences and similarities between prokaryotic cells (bacteria, archaea) and eukaryotic cells (animals, plants). The second part will address one of the central issues of biology: evolution. Fundamental mechanisms and hypotheses will be discussed and students will be introduced to major phylogenetic reconstruction methods. Using the examples of plants and animals, the subsequent module components will introduce students to the phylogenetic diversity of eukaryotes. At the level of groups in the plant and animal kingdoms, students will acquire the fundamental knowledge necessary to understand the forms and functions of animal and plant organisms, with morphology and cytology being discussed in an evolutionary and ecological context. The contents of the module are relevant for biological disciplines at all levels of biological organisation.

Intended learning outcomes

- Knowledge of the structures of prokaryotic and eukaryotic cells and their (biological) macromolecules.
- Knowledge of the specific characteristics of the intracellular and extracellular structures of prokaryotes as well as animal and plant cells.
- Ability to recognise evolution as the driving force behind the phylogeny of species.
- Familiarity with the concepts of phylogenetic relationships between plants/animals.
- Familiarity with the distinguishing characteristics and major representatives of groups in the plant and animal kingdoms.
- Ability to select those plant and animal organisms that are most suitable for particular scientific issues.
- Familiarity with the components and functioning of microscopes.

Courses

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

Method of assessment

4 written examinations (including multiple choice questions): 3 examinations: 60 minutes each (graded); 1 examination: 30 minutes (ungraded); weighted 1:1:1:1

Allocation of places

- 

Additional information

- 

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

- 

Bachelor's with 1 major Biochemistry (2013)
## Module title

**Inorganic Chemistry 1**

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<thead>
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<th>Abbreviation</th>
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<tbody>
<tr>
<td>08-AC1-BC-111-m01</td>
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### Module coordinator

lecturer of lecture "Experimentalchemie" (Experimental Chemistry)

### Module offered by

Institute of Inorganic Chemistry

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### Duration

1 semester

### Module level

undergraduate

### Other prerequisites

By way of exception, additional prerequisites are listed in the section on assessments.

## 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)

This module comprises 3 module components. Information on courses will be listed separately for each module component.

- **08-AC1-BC-2-092:** P (no information on SWS (weekly contact hours) and course language available)
- **08-AC1-BC-3-092:** V (no information on SWS (weekly contact hours) and course language available)
- **08-AC1-1-102:** V + 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 is creditable for 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 08-AC1-BC-2-092: Practical course of Inorganic Chemistry 1 for Biochemistry Majors

- 4 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each), assessment of practical performance (log approx. 5 to 10 pages), Nachtestate (post-experiment exams, approx. 15 minutes each)
- Assessment offered: once a year, winter semester

### Assessment in module component 08-AC1-BC-3-092: Accompanying lecture to the practical course of Inorganic Chemistry 1 for Biochemistry Majors
• 2 ECTS, Method of grading: numerical grade
• 2 written examinations (approx. 45 minutes each), weighted 1:1

**Assessment in module component 08-AC1-1-102: Principles of Inorganic Chemistry**

- 10 ECTS, Method of grading: numerical grade
- a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 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
- Other prerequisites: Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).

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<td>§ 42 (1) 1. Chemie &quot;Allgemeine und Anorganische Chemie&quot; und &quot;Physikalische und Analytische Chemie&quot;</td>
</tr>
<tr>
<td>§ 62 (1) 1. Chemie &quot;Allgemeine und Anorganische Chemie&quot;; &quot;Physikalische und Analytische Chemie&quot;</td>
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### Module title
Organic Chemistry 1

### Abbreviation
08-OC1-092-m01

### Module coordinator
holder of the Professorship of Organic Chemistry

### Module offered by
Institute of Organic Chemistry

### ECTS
5

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

### Numerical grade
--

### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).

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

Das Modul bietet einen Überblick über die elementaren Grundkenntnisse der organischen Chemie. Dazu wird die Bindungssituation am Kohlenstoff betrachtet und in die Nomenklatur einfacher und mäßig komplexer organischer Verbindungen eingeführt. Es werden Grundlagen der Stereochemie, Substitutions-, Additions- und Eliminierungsreaktionen sowie der Syntheseplanung vermittelt.

### 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
(a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 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)

### Allocation of places
--

### Additional information
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### Referred to in LPO I
§ 62 (1) 2. Chemie "Organische und Bioorganische Chemie"
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<td>Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).</td>
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</table>

**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)

V + 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 is creditable for 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, English

**Allocation of places**

--

**Additional information**

--

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

--
## Module title
**Organic Chemistry - laboratory course for students of biochemistry**

### Abbreviation
08-OC3P-112-m01

### Module coordinator
holder of the Chair of Organic Chemistry II

### Module offered by
Institute of Organic Chemistry

### ECTS
7

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

### (not) successfully completed
08-OC1 and 08-AC1-BC (module component 08-AC1-BC-2 only)

### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
--

### 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)

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 is creditable for bonus)

Vortestate (pre-experiment exams, approx. 15 minutes each), assessment of practical performance (log approx. 5 to 10 pages), Nachtestate (post-experiment exams, approx. 15 minutes each)

Assessment offered: once a year, summer semester

### Allocation of places
--

### Additional information
--

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

--
### Module title
Physical Chemistry 1

### Abbreviation
08-PC1-092-m01

### Module coordinator
Lecturer of lecture "Grundlagen der Quantenmechanik and Spektroskopie" (Principles of Quantum Mechanics and Spectroscopy)

### Module offered by
Institute of Physical and Theoretical Chemistry

### ECTS
8

### Method of grading
Numerical grade

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

### Duration
1 semester

### Module level
Undergraduate

### Other prerequisites
Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).

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


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

Die Studierenden sind in der Lage, grundlegende Modelle der Quantenmechanik zu erklären und bei Molekülen anzuwenden. Er/Sie kann unterschiedliche spektroskopische Methoden darstellen. Die Studierenden können die mathematischen Grundlagen der elementaren der Quantenmechanik anwenden.

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

### Method of assessment
(a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 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)

### 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>lecturer of lecture &quot;Thermodynamik, Kinetik, Elektrochemie&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<td>1 semester</td>
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<td>Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).</td>
</tr>
</tbody>
</table>

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, die Hauptsätze der Thermodynamik zu erklären. Er/Sie kann thermodynamische Aspekte von Lösungen, Gasen, Mischphasen sowie elektrochemischen Reaktionen darstellen. Die Studierenden können chemische Reaktionen auf kinetischer Ebene interpretieren.

**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 is creditable for bonus)

a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 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)

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

§ 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"
Module title

Practical course of Physical Chemistry for Biochemistry Majors

Abbreviation

08-PC2P-132-m01

Module coordinator

lecturer of lecture "Thermodynamik, Kinetik, Elektrochemie"

Module offered by

Institute of Physical and Theoretical Chemistry

ECTS

6

Method of grading

Only after succ. compl. of module(s)

(Not) successfully completed

08-PC1 (module component 08-PC1-1 only)

Duration

1 semester

Module level

undergraduate

Other prerequisites

--

Contents

German contents available but not translated yet.


Intended learning outcomes

German intended learning outcomes available but not translated yet.


Courses

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

Method of assessment

Vortestate (pre-experiment exams), assessment of practical performance, Nachtestate (post-experiment exams), examination talks (approx. 15 minutes each), logs (approx. 5 to 10 pages)

Assessment offered: once a year, winter semester

Allocation of places

--

Additional information

--

Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title
Bioanalytics

Abbreviation
08-BAN-092-m01

Module coordinator
holder of the Chair of Biochemistry

Module offered by
Chair of Biochemistry

ECTS
8

Method of grading
numerical grade

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

Duration
1 semester

Module level
undergraduate

Other prerequisites
--

Contents
The module imparts the theoretical and practical fundamentals of bioanalysis by lectures and both theoretical and practical exercises.

Intended learning outcomes
After attending the module events the student has basic knowledge of bioanalysis and is able to apply the contents in practical experiments.

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

• 08-BAN-1-092: V + Ü (no information on SWS (weekly contact hours) and course language available)

• 08-BAN-2-092: 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 08-BAN-1-092: Principles of Bioanalytics Principles of Bioanalytics

• 3 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 e) 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

Assessment in module component 08-BAN-2-092: Bioanalytics (practical course)

• 5 ECTS, Method of grading: (not) successfully completed

• 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 (approx. 30 minutes) Students will be informed about the method and length of the assessment prior to the course.

• Assessment offered: once a year, summer semester

• 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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<table>
<thead>
<tr>
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<th>Abbreviation</th>
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<tbody>
<tr>
<td>Principles of Biochemistry</td>
<td>08-BC-132-m01</td>
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<tbody>
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<td>holder of the Chair of Biochemistry</td>
<td>Chair of Biochemistry</td>
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<th>Other prerequisites</th>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</tbody>
</table>

**Contents**
The module imparts the basic knowledge of biochemistry by lectures and in-depth tutorials.

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

Der/Die Studierende verfügt über Grundlagenkenntnisse der Biochemie. Er/Sie ist in der Lage, die grundlegenden biochemischen Prozesse in zellulären Systemen zu beschreiben.

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

- 08-BC-1-132: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 08-BC-2-132: 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 08-BC-1-132: Principles of Biochemistry 1 Principles of Biochemistry 1**
- 3 ECTS, Method of grading: numerical grade
- written examination (approx. 60 to 90 minutes)

**Assessment in module component 08-BC-2-132: Principles of Biochemistry 2 Principles of Biochemistry 2**
- 3 ECTS, Method of grading: numerical grade
- written examination (approx. 60 to 90 minutes)

**Allocation of places**
--

**Additional information**
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**Referred to in LPO I** (examination regulations for teaching-degree programmes)
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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Biochemistry for Biochemistry Majors (Exercises)</td>
<td>08-BCBCP-132-m01</td>
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**Module coordinator**

holder of the Chair of Biochemistry

**Module offered by**

Chair of Biochemistry

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

**Duration**

1 semester

**Module level**

undergraduate

**Contents**

In this module the basics of scientific biochemical experimentation shall be practiced in practical exercises.

**Intended learning outcomes**

After participating in the practical exercises the students master basic biochemical methods and are able to purposefully apply them.

**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 is creditable for 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 (approx. 30 minutes) Students will be informed about the method and length of the assessment prior to the course.

Assessment offered: once a year, summer semester

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Module title
Molecular Biology for Biochemistry students

Abbreviation
o8-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 o8-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 (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.

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

Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Mathematics for students in Chemistry and Biology</td>
<td>10-M-MCB-132-m01</td>
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<th>Module coordinator</th>
<th>Module offered by</th>
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<tr>
<td>Dean of Studies Mathematik (Mathematics)</td>
<td>Institute of Mathematics</td>
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<th>Module level</th>
<th>Other prerequisites</th>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>Admission prerequisite to assessment: successful completion of exercises (approx. 25 to 30 hours).</td>
</tr>
</tbody>
</table>

**Contents**

Functional relations, differentiation and integration of functions in one variable, curve sketching, differentiation of functions in several variables, power series, ordinary differential equations, systems of linear equations, basic notions in statistics.

**Intended learning outcomes**

The student is able to recognise and phrase simple questions from natural sciences as mathematical problems, apply basic mathematical methods to them and interpret the results.

**Courses**

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

**Method of assessment**

written examination (approx. 90 to 120 minutes)

**Allocation of places**

--

**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Introduction to Physics for Students of Non-physics-related Minor Subjects</td>
<td>11-EFNF-072-m01</td>
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### Module coordinator
Managing Director of the Institute of Applied Physics

### Module offered by
Faculty of Physics and Astronomy

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<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Other prerequisites</th>
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<tr>
<td>7</td>
<td>numerical grade</td>
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</table>

### Duration
2 semester

### Module level
undergraduate

### Contents
Mechanics, vibration theory, thermodynamics, optics, science of electricity, Atomic and Nuclear Physics.

### Intended learning outcomes
The students have knowledge of the principles of Physics.

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

### Method of assessment
written examination (approx. 120 minutes)

### Allocation of places
Only as part of pool of general key skills (ASQ): 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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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Practical Course Physics for Students of Non-physics-related Minor Subjects</td>
<td>11-PFNF-072-m01</td>
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<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>Managing Director of the Institute of Applied Physics</td>
<td>Faculty of Physics and Astronomy</td>
</tr>
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</table>

| ECTS | Method of grading | Other prerequisites | |
|------|-------------------|---------------------|
| 3    | Only after succ. compl. of module(s) |                     |

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

**Contents**

Mechanics, vibration theory, thermodynamics, optics, X-rays, nuclear magnetic resonance, Atomic and Nuclear Physics.

**Intended learning outcomes**

The students have knowledge of the principles of Physics.

**Courses**

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

**Method of assessment**

a) oral test (approx. 15 minutes) during experiment and b) ungraded written examination (approx. 90 minutes)

**Allocation of places**

Only as part of pool of general key skills (ASQ): 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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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Consolidation Seminar</td>
<td>08-VS-BC-132-m01</td>
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<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>chairperson of examination committee Biochemie (Biochemistry)</td>
<td>Chair of Biochemistry</td>
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<th>ECTS</th>
<th>Method of grading</th>
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<td>3</td>
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<th>Other prerequisites</th>
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<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Im Vertiefungsseminar stellt der/die Studierende die Ergebnisse eines eigenen praktischen wissenschaftlichen Projektes im Rahmen einer Präsentation mit anschließender kritischer Diskussion vor.

**Intended learning outcomes**

The student is able to present the results of his/her Thesis. He/She can defend the choice of the experimental approaches used, the results as well as their evaluation and interpretation in a scientific discussion.

**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 is creditable for bonus)

oral examination (approx. 30 minutes) on a paper written by the candidate

Language of assessment: German or English

**Allocation of places**

--

**Additional information**

--

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

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Thesis
(12 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Bachelor Thesis in Biochemistry</td>
<td>08-BA-BC-132-m01</td>
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<th>Module coordinator</th>
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<tr>
<td>chairperson of examination committee Biochemie (Biochemistry)</td>
<td>Chair of Biochemistry</td>
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<th>Other prerequisites</th>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

**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.

**Intended learning outcomes**
The student has the ability to deal with a defined problem/issue using scientific methods and to document the results.

**Courses** (type, number of weekly contact hours, language — if other than German)
no courses assigned

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written thesis (50 to 70 pages)
Language of assessment: German or English

**Allocation of places**
--

**Additional information**
Additional information on module duration: 10 weeks.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)
--
Subject-specific Key Skills

(15-17 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Mathematical Biology and Biostatistics</td>
<td>07-M-BST-132-m01</td>
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<td>holder of the Chair of Bioinformatics</td>
<td>Faculty of Biology</td>
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<th>Module level</th>
<th>Other prerequisites</th>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

### Contents

Fundamental principles of the most important mathematical and statistical methods in biology.

### Intended learning outcomes

Students will have acquired fundamental skills in the evaluation of experiments, the interpretation of readings and numbers as well as the mathematical description of biological processes.

### Courses

<table>
<thead>
<tr>
<th>type, number of weekly contact hours, language — if other than German</th>
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<tbody>
<tr>
<td>V + Ü (no information on SWS (weekly contact hours) and course language available)</td>
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### Method of assessment

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

written examination (approx. 60 minutes)

### Allocation of places

--

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<table>
<thead>
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<tr>
<td>Information Literacy for Students of the Natural Sciences (Basic Level)</td>
<td>41-IK-NW1-101-m01</td>
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<td>head of University Library</td>
<td>University Library</td>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

### Contents

Information literacy in an academic context:
- Search strategies and tools.
- Using the library's electronic resources.
- Resources for natural sciences: databases and journals.
- Online searches and search engines.
- Overview of additional resources (eLearning etc.).
- Reference management. Some sections of the module will focus on particular disciplines (wherever possible, on disciplines in the natural sciences).

### Intended learning outcomes

Students know what information is needed for what purpose. They are able to locate information that is relevant within their discipline and beyond in a variety of resources and to evaluate this information. They recognise the difference in quality between information they have retrieved from specific, restricted access resources (databases) and information they have found on the free web. Students are able to manage and process the information they have found, using reference management software and eLearning tools. The module aims to equip students with the skills needed to find information and literature that is relevant to the topics of their Bachelor’s theses.

### Courses

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

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

### Method of assessment

a) written examination (approx. 60 minutes) or b) preparing and delivering a presentation with slides (approx. 10 minutes or approx. 5 minutes and approx. 1 page) or c) completing exercises (approx. 10 exercises) or d) presentation without slides (approx. 20 to 30 minutes) or e) preparing and delivering a presentation with slides (approx. 5 minutes) and completing exercises (approx. 5 exercises) or f) presentation without slides (approx. 10 to 15 minutes) and completing exercises (approx. 5 exercises)

### Allocation of places

Number of places: 5-50. There is a restricted number of places. If necessary, places will be allocated as follows: Students of the degree programmes of the respective subject-specific focuses will be given preferential consideration. The remaining places, if and when any become available, will be allocated to students of the other natural sciences degree programmes. In each of the above-mentioned groups, 30% of places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. The remaining 70% of places will each 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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<table>
<thead>
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<tr>
<td>Information Literacy for Students of the Natural Sciences (Advanced Level)</td>
<td>41-IK-NW2-101-m01</td>
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<td>University Library</td>
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<td>2</td>
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<td>Knowledge and skills equivalent to those achieved in the basic module desirable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Contents</th>
</tr>
</thead>
</table>
| 1 semester | undergraduate | Information literacy in an academic context:  
- More in-depth discussion of selected topics that were covered in the level one module, e.g. searching subject-specific databases.  
- Publishing and information practices in the natural sciences.  
- Subject-specific information retrieval tools, e.g. classifications and thesauri.  
- New web-based information and communication technologies.  
- Searching for subject-specific facts (e.g. substances and physical data).  
- Information search skills for the workplace.  
- Copyright and citations.  
- Electronic publishing. Some sessions will focus on particular disciplines (wherever possible, on disciplines in the natural sciences). |

<table>
<thead>
<tr>
<th>Intended learning outcomes</th>
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</thead>
<tbody>
<tr>
<td>Students have developed a differentiated understanding of the publishing and information practices in their discipline and are familiar with the possibilities offered by electronic publishing. They are able to use electronic tools to locate subject-specific facts in a variety of resources. Students are able to work with subject-specific information retrieval tools as well as to use new web-based technologies to share information. They have developed an understanding of the legal framework surrounding publications, information, and communication in an academic context and are able to use information responsibly.</td>
</tr>
</tbody>
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<tr>
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<th>Method of assessment</th>
<th>(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) written examination (approx. 60 minutes) or b) preparing and delivering a presentation with slides (approx. 10 minutes or approx. 5 minutes and approx. 1 page) or c) completing exercises (approx. 10 exercises) or d) presentation without slides (approx. 20 to 30 minutes) or e) preparing and delivering a presentation with slides (approx. 5 minutes and completing exercises (approx. 5 exercises) or f) presentation without slides (approx. 10 to 15 minutes) and completing exercises (approx. 5 exercises)</td>
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<table>
<thead>
<tr>
<th>Allocation of places</th>
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</thead>
<tbody>
<tr>
<td>Number of places: 10 to 50. There is a restricted number of places. If necessary, places will be allocated as follows: Students of the degree programmes of the respective subject-specific focuses will be given preferential consideration. The remaining places, if and when any become available, will be allocated to students of the other natural sciences degree programmes. In each of the above-mentioned groups, 30% of places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. The remaining 70% of places will each be allocated by lot.</td>
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<th>Additional information</th>
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<tr>
<td>Philosophy 2</td>
<td>06-B-P2TF2-102-m01</td>
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<tr>
<td>holder of the Chair of Theoretical Philosophy</td>
<td>Institute of Philosophy</td>
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<th>Other prerequisites</th>
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<tr>
<td>5</td>
<td>Only after succ. compl. of module(s)</td>
<td>Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).</td>
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<th>Duration</th>
<th>Module level</th>
<th>Contents</th>
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<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>Introduction to the theory of intellectual disciplines; philosophical bases of the humanities and the social sciences.</td>
</tr>
</tbody>
</table>

**Intended learning outcomes**

Content-related outcomes:
- insight into the relationship of philosophy to individual intellectual disciplines
- ability to reflect on the historical and intellectual origins of our knowledge culture
- ability to organise topics into overarching historical, social, and political schemata
- insight into the scope and limits of various intellectual disciplines
- knowledge of, and ability to criticise, basic assumptions in systems of thought, culture, and knowledge

Formal outcomes (skills to be tested in the assessment):
- ability to analyse philosophical texts and issues
- ability to organise concepts and philosophical positions into overarching intellectual schemata
- ability to present philosophical positions in a structured and linguistically appropriate manner

**Courses**

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

**Method of assessment**

written examination (approx. 90 minutes)

**Allocation of places**

Only as part of pool of general key skills (ASQ): maximum 20 places. Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, 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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## Bioinformatics

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<td>Faculty of Biology</td>
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<tbody>
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<td>1 semester</td>
<td>undergraduate</td>
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</table>

### Contents

Fundamental principles of bioinformatics.

### Intended learning outcomes

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

### Courses

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

### Method of assessment

written examination (approx. 20 minutes)

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)
Module title: Toxicology and legal studies
Abbreviation: 03-TR-072-m01

Module coordinator: Lecturer of lecture "Toxikologie und Rechtskunde"
Module offered by: Faculty of Medicine

ECTS: 3
Method of grading: Numerical grade
Only after succ. compl. of module(s): --

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

Contents:
Basics of legal regulations for chemists (handling and transportation of hazardous materials), fundamentals of toxicology.

Intended learning outcomes:
The students master the basics of legal regulations for chemists (handling and transport of hazardous substances) as well as the fundamentals of toxicology.

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

Method of assessment:
Written examination (approx. 90 minutes)

Allocation of places:
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Additional information:
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<thead>
<tr>
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<td>Contemporary Research in Biochemistry</td>
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**Contents**

Presentation of current research results in the Biocentre colloquium and discussion of recent literature.

**Intended learning outcomes**

Students are introduced to the topics of current research in the life sciences.

**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 is creditable for bonus)*

attendance of 80% of talks

**Allocation of places**

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**Additional information**

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<td>Physiology</td>
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**Module coordinator**
Managing Director of the Institute of Physiology

**Module offered by**
Faculty of Medicine

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<td>3</td>
<td>numerical grade</td>
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</table>

**Duration**
1 semester

**Module level**
undergraduate

**Other prerequisites**
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**Contents**
Neurophysiology, cardiac/circulatory function, kidney, blood, respiration, acid/base homeostasis, endocrinology, nutrition and digestion, liver function.

**Intended learning outcomes**
Students are familiar with the fundamental principles of human physiology.

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

**Method of assessment**
written examination (30 multiple choice questions)

**Allocation of places**
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**Additional information**
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<td>chairperson of examination committee Biochemie (Biochemistry)</td>
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**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 is creditable for bonus)

log (approx. 30 pages) or talk (approx. 20 minutes)
Language of assessment: German or English

**Allocation of places**

--

**Additional information**

Additional information on module duration: 6 weeks.

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

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<table>
<thead>
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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 is creditable for bonus)

log (approx. 20 pages) or talk (approx. 15 minutes)

Language of assessment: German or English

Allocation of places

--

Additional information

Additional information on module duration: 3 weeks.

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

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<thead>
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**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 Bachelor 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 is creditable for bonus)

log (approx. 30 pages) or talk (approx. 20 minutes)

Language of assessment: German or English

**Allocation of places**

--

**Additional information**

Additional information on module duration: 6 weeks.

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

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**Intended learning outcomes**

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**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 is creditable for bonus)

log (approx. 20 pages) or talk (approx. 15 minutes)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

Additional information on module duration: 3 weeks.

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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 is creditable for bonus)

log (approx. 30 pages) or talk (approx. 20 minutes)

Language of assessment: German or English

**Allocation of places**

--

**Additional information**

Additional information on module duration: 6 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 is creditable for bonus)

log (approx. 20 pages) or talk (approx. 15 minutes)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

Additional information on module duration: 3 weeks.

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

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<tbody>
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<td>1 semester</td>
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</table>

**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)

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 is creditable for bonus)

preparation of materials for demonstrations and exercises (approx. 120 hours total)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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

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<table>
<thead>
<tr>
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<th>Abbreviation</th>
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<tr>
<td>Scientific lecturing 2</td>
<td>08-WIRE2-132-m01</td>
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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)

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 is creditable for bonus)

preparation of materials for demonstrations and exercises (approx. 120 hours total)
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**

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**

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

**Method of assessment**

presentation (approx. 10 minutes)

Language of assessment: German or English

**Allocation of places**

--

**Additional information**

--

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

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## Module title

Contemporary Research in Biochemistry 2

| Abbreviation | 08-AFBC2-111-m01 |

## Module coordinator

holder of the Chair of Biochemistry

## Module offered by

Chair of Biochemistry

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## Duration

2 semester

## Module level

undergraduate

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## 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

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

## Method of assessment

presentation (approx. 10 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

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### 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

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

### Method of assessment

presentation (approx. 10 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 student attends a biochemistry-related project pre-agreed by the module responsible, subsequently reporting about the outcome.

**Intended learning outcomes**

The student acquires specific biochemistry-related skills and is able to reflect about the project in a final report.

**Courses**

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

**Method of assessment**

short log (approx. 1 page)

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
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### Intended learning outcomes
The student acquires specific biochemistry-related skills and is able to reflect about the project in a final report.

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

### Method of assessment
short log (approx. 1 page)
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 student attends a biochemistry-related project pre-agreed by the module responsible, subsequently reporting about the outcome.

### Intended learning outcomes
The student acquires specific biochemistry-related skills and is able to reflect about the project in a final report.

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

### Method of assessment
- **Type:** short log (approx. 1 page)
- **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 Catalogue for the Subject
**Biochemistry**

**Bachelor's with 1 major, 180 ECTS credits**

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</table>

#### 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

S (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

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#### Additional information

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#### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
**Module title**
Inorganic Chemistry 3 for Biochemistry Majors

**Abbreviation**
08-AC3-BC-131-m01

**Module coordinator**
Lecturer of lecture "Elementorganische Chemie" (Elemental Organic Chemistry)

**Module offered by**
Institute of Inorganic Chemistry

**ECTS**
9

**Method of grading**
Numerical grade

**Only after succ. compl. of module(s)**
o8-OC3P

**Duration**
1 semester

**Module level**
Undergraduate

**Other prerequisites**
By way of exception, additional prerequisites are listed in the section on assessments.

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

- 08-AC3-BC-2-131: P (no information on SWS (weekly contact hours) and course language available)
- 08-AC3-1-102: 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 is creditable for 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 08-AC3-BC-2-131:** Inorganic Chemistry 2 (lab) for Biochemistry Majors
- 5 ECTS, Method of grading: (not) successfully completed
- Pre/post-experiment examination talks (Vor-/Nachtestate, approx. 15 minutes each), log (approx. 5 to 10 pages)
- Language of assessment: German or English

**Assessment in module component 08-AC3-1-102:** Elemental Organic Chemistry Elemental Organic Chemistry
- 4 ECTS, Method of grading: numerical grade
- 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, English
- Other prerequisites: Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).

### 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
Physical and Theoretical Chemistry 3: Symmetry and Quantum Chemistry

Abbreviation
08-PC3-092-m01

Module coordinator
lecturer of lecture "Quantenchemie"

Module offered by
Institute of Physical and Theoretical Chemistry

ECTS
6

Method of grading
numerical grade

Duration
1 semester

Module level
undergraduate

Other prerequisites
Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).

Contents
This module deals with basics of quantum chemistry and symmetry in chemistry.

Intended learning outcomes
Der/Die Studierende verfügt über Kenntnisse der Quantenchemie und der Symmetrie in der Chemie und kann diese gezielt anwenden.

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

Method of assessment
a) 1 to 3 written examinations (1 written examination: 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 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)

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
--- | ---
Chemistry of the Elements and Analytical Chemistry for Biochemistry Majors | 08-AS1-BC-132-m01

Module coordinator | Module offered by
--- | ---
Lecturer of lecture "Chemie der Hauptgruppenelemente" (Chemistry of Main-group Elements) | Institute of Inorganic Chemistry

ECTS | Method of grading | Only after succ. compl. of module(s)
--- | --- | ---
11 | Numerical grade | 08-AC1 (module component 08-AC1-4 only) and 08-OC3 (module component 08-OC3-2 only)

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

Contents

German contents available but not translated yet.


Intended learning outcomes

German intended learning outcomes available but not translated yet.


Courses

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

- 08-AN1-BC-2-132: P (no information on SWS (weekly contact hours) and course language available)
- 08-AS1-1-102: V + V (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 08-AN1-BC-2-132: Analytical Chemistry (lab) for Biochemistry Majors

- 5 ECTS, Method of grading: (not) successfully completed
- Pre/post-experiment examination talks (Vor-/Nachtestate, approx. 15 minutes each), log (approx. 5 to 10 pages)
- Assessment offered: once a year, summer semester
- Language of assessment: German or English

Assessment in module component 08-AS1-1-102: Chemistry of the elements Chemistry of the elements

- 6 ECTS, Method of grading: numerical grade
- 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
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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

§ 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"
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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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to 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)

--
### Module title
Additional Qualification in Natural Sciences 3

### Abbreviation
08-BC-ZQN3-141-m01

### Module coordinator
chairperson of examination committee Biochemie (Biochemistry)

### Module offered by
Chair of Biochemistry

### ECTS
3

### Method of grading

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### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
Please consult with academic advisory service in advance.

### Contents
Extracurricular event dealing with a life-science issue, which represents a special subject-related expansion of scientific knowledge. This may be a module offered internally or externally of the University of Würzburg. Recognition as academic achievement is conducted in an individual assessment by the examination board.

### Intended learning outcomes
The student has improved scientific knowledge, which contributes to the sharpening of specific qualifications. In particular, he/she gained additional expertise that contributes to individual specialization.

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

### Method of assessment
- a) written examination (approx. 60 to 90 minutes)
- b) log (approx. 20 pages)
- c) oral examination of one candidate each (approx. 20 minutes)
- d) oral examination in groups of up to 3 candidates (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes)
- e) presentation (approx. 30 minutes)
- f) successful completion as certified by lecturer.

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 Catalogue for the Subject 
**Biochemistry**  
Bachelor’s with 1 major, 180 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Qualification in Natural Sciences 5</td>
<td>08-BC-ZQN5-141-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
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<tbody>
<tr>
<td>chairperson of examination committee Biochemie (Biochemistry)</td>
<td>Chair of Biochemistry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
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<tbody>
<tr>
<td>5</td>
<td>(not) successfully completed</td>
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<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
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<tbody>
<tr>
<td>1 semester</td>
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</table>

### Contents

Extracurricular event dealing with a life-science issue, which represents a special subject-related expansion of scientific knowledge. This may be a module offered internally or externally of the University of Würzburg. Recognition as academic achievement is conducted in an individual assessment by the examination board.

### Intended learning outcomes

The student has improved scientific knowledge, which contributes to the sharpening of specific qualifications. In particular, he/she gained additional expertise that contributes to individual specialization.

### Courses

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 is creditable for 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) or f) successful completion as certified by lecturer. 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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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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### Module Catalogue for the Subject Biochemistry

**Bachelor's with 1 major, 180 ECTS credits**

<table>
<thead>
<tr>
<th>Module title</th>
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<td>08-BC-EQN3-141-m01</td>
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<td>numerical grade</td>
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### Intended learning outcomes

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### Courses

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

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

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</table>

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

Completable Qualification in Natural Sciences 5

### Abbreviation

08-BC-EQN5-141-m01

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### Intended learning outcomes

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### Courses

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

### Method of assessment

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) or f) successful completion as certified by lecturer. 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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### Referred to in LPO I

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