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

Examination regulations version: 2010
Responsible: Faculty of Chemistry and Pharmacy
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Content and Objectives of the Programme

The chemistry program in Würzburg offers a research-oriented curriculum. Graduates of the Bachelor-program in chemistry are acquainted with the fundamentals of chemistry, possess the relevant experimental skills and are familiar with the general methods of scientific research.

In lectures and tutorials the basic knowledge of the various areas of chemistry is imparted as well as the foundations of mathematics and physics. A further hallmark is the comparably large number of student lab courses. In these labs the laboratory skills and techniques used in experimental scientific work are taught. During their Bachelor thesis the students finally work for a limited time on a specific chemical problem. They demonstrate their scientific abilities in work which is performed under guidance, but to a large extent independently.

The students obtain the necessary knowledge to attend a research-oriented Masters program. In addition they possess the basic qualifications necessary for further professional training in industry and business. In supplementary modules they acquire science-related soft skills in specific areas of chemistry and general soft skills that match their personal interests and serve as an additional qualification for various professional areas.
Abbreviations used

Course types: \( E = \) field trip, \( K = \) colloquium, \( O = \) conversatorium, \( P = \) placement/lab course, \( R = \) project, \( S = \) seminar, \( T = \) tutorial, \( Ü = \) exercise, \( V = \) lecture

Term: \( SS = \) summer semester, \( WS = \) winter semester

Methods of grading: \( \text{NUM} = \) numerical grade, \( B/NB = \) (not) successfully completed

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

Other: \( A = \) thesis, \( LV = \) course(s), \( PL = \) assessment(s), \( TN = \) participants, \( VL = \) prerequisite(s)

Conventions

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with

the general regulations governing the degree subject described in this module catalogue:

\[ \text{ASPO2009} \]

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

\[ 10-\text{May-2011 (2011-37)} \]

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

(150 ECTS credits)
General and Inorganic Chemistry

(47 ECTS credits)
Module title
Inorganic Chemistry 1

Abbreviation
08-AC1-102-m01

Module coordinator
Lecturer of lecture "Experimentalchemie" (Experimental Chemistry)

Module offered by
Institute of Inorganic Chemistry

ECTS
21

Method of grading
Numerical grade

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

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

This module has 4 components; information on courses listed separately for each component.

- 08-AC1-1-102: V + V + Ü (no information on language and number of weekly contact hours available)
- 08-AC1-2-102: P (no information on language and number of weekly contact hours available)
- 08-AC1-3-102: V (no information on language and number of weekly contact hours available)
- 08-AC1-4-102: P (no information on language and number of weekly contact hours available)

Method of assessment

This module has the following 4 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole.

Assessment in module component 08-AC1-2-102: Praktikum Anorganische Chemie 1 (Lab Course Inorganic Chemistry 1)

- 6 ECTS credits, pass / fail
- 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: Module component 08-AC1-2 can only be taken by students who successfully completed module component 08-AC1-4.
Assessment in module component 08-AC1-3-102: Erläuterungen zum Praktikum Anorganische Chemie 1 (Discussion of Experiments Performed in Lab Course Inorganic Chemistry 1)
- 4 ECTS credits, numerical grading
- a) 1 to 3 written examinations (approx. 45, 60 or 90 minutes each) or x) oral examination of one candidate each (approx. 20 minutes) or x) oral examination in groups of 2 candidates (approx. 30 minutes total)
- Language of assessment: German, English

Assessment in module component 08-AC1-4-102: Sicheres Arbeiten in chemischen Laboratorien (Chemical Laboratory Safety)
- 1 ECTS credit, pass / fail
- Assessment of practical assignments
- Language of assessment: German, English

Assessment in module component 08-AC1-1-102: Grundlagen der Allgemeinen und Anorganischen Chemie (Fundamental Principles of General and Inorganic Chemistry)
- 10 ECTS credits, numerical grading
- a) 1 to 3 written examinations (1 written examination: approx. 90 minutes, 2 written examinations: 60 minutes 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 of 2 candidates (approx. 30 minutes)
- Language of assessment: German or English
- Additional 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 no more than 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)
§ 42 (1) 1. Chemie "Allgemeine und Anorganische Chemie" und "Physikalische und Analytische Chemie"
§ 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"
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<td>08-AC2-102-m01</td>
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<td>lecturer of lecture &quot;Festkörperchemie&quot; (Solid State Chemistry)</td>
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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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

V + 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) 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**

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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
---|---
Inorganic Chemistry 3 | 08-AC3-102-m01

Module coordinator | Module offered by
lecturer of lecture "Elementorganische Chemie" (Elemental Organic Chemistry) | Institute of Inorganic Chemistry

ECTS | Method of grading | Only after succ. compl. of module(s)
---|---|---
9 | 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 | 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-AC3-1-102: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 08-AC3-2-102: 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)

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-AC3-1-102: 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).

Assessment in module component 08-AC3-2-102: Inorganic Chemistry 2 (lab)
- 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, English

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<td>lecturer of lecture &quot;Chemie der Hauptgruppenelemente&quot; (Chemistry of Main-group Elements)</td>
<td>Institute of Inorganic Chemistry</td>
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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


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

This module comprises 2 module components. Information on courses will be listed separately for each module component.
- 08-AN1-2-102: 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** (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-AN1-2-102: Analytical Chemistry (lab)**
- 5 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams), assessment of practical performance, Nachtestate (post-experiment exams), log (5 to 10 pages)
- Assessment offered: once a year, summer semester
- Language of assessment: German, 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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Organic Chemistry
(39 ECTS credits)
Module title | Abbreviation
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Organic Chemistry 1 | 08-OC1-092-m01

Module coordinator | Module offered by
holder of the Professorship of Organic Chemistry | Institute of Organic Chemistry

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Duration | Module level | Other prerequisites
1 semester | undergraduate | 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 (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
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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"
### Module Catalogue for the Subject Chemistry

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

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<td>holder of the Chair of Physically Organic Chemistry</td>
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<th>Duration</th>
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<tr>
<td>1 semester</td>
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### Contents

German contents available but not translated yet.


### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

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

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

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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
--- | ---
Organic Chemistry 3 | 08-OC3-102-m01

Module coordinator | Module offered by
--- | ---
holder of the Professorship of Organic Chemistry | Institute of Organic Chemistry

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Duration | Module level | Other prerequisites
--- | --- | ---
1 semester | undergraduate | 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-OC3-1-102: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 08-OC3-2-102: 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)
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-OC3-1-102: Organic Chemistry 3 Organic Chemistry 3
- 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, 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).

**Assessment in module component 08-OC3-2-102: Organic Chemistry - lab 1**
- 9 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, English

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Module title: Organic Chemistry 4

Abbreviation: o8-OC4-102-m01

Module coordinator: holder of the Chair of Organic Chemistry II

Module offered by: Institute of Organic Chemistry

ECTS: 10

Method of grading: numerical grade

Only after success. compl. of module(s)

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.

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:

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

Additional information

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

§ 62 (1) 2. Chemie "Organische und Bioorganische Chemie"
Physical and Theoretical Chemistry
(38 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Physical Chemistry 1</td>
<td>08-PC1-092-m01</td>
</tr>
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<table>
<thead>
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<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecturer of lecture &quot;Grundlagen der Quantenmechanik and Spektroskopie&quot; (Principles of Quantum Mechanics and Spectroscopy)</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<th>Module level</th>
<th>Other prerequisites</th>
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<tbody>
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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, 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**

(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)

--
### Module title

**Physical Chemistry 2: Thermodynamics, Kinetics, Electrochemistry**

### Abbreviation

08-PC2-092-m01

### Module coordinator

Lecturer of lecture "Thermodynamik, Kinetik, Elektrochemie"

### Module offered by

Institute of Physical and Theoretical Chemistry

### ECTS

18

### Method of grading

Numerical grade

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

--

### 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

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

- 08-PC2-2-092: P (no information on SWS (weekly contact hours) and course language available)
- 08-PC2-1-092: 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-PC2-2-092: Physical Chemistry (lab)**

- 9 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each), assessment of practical performance, Nachtestate (post-experiment exams, approx. 15 minutes each)
- Assessment offered: once a year, winter semester
- Only after successful completion of module components: 08-PC1-1 oder 08-PC2-1

**Assessment in module component 08-PC2-1-092: Thermodynamics, Kinetics, Electrochemistry**

- 9 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)

Bachelor’s with 1 major Chemistry (2010)
- 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).

<table>
<thead>
<tr>
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<table>
<thead>
<tr>
<th>Additional information</th>
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<tr>
<td>(examination regulations for teaching-degree programmes)</td>
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§ 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"
<table>
<thead>
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<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Physical and Theoretical Chemistry 3: Symmetry and Quantum Chemistry</td>
<td>08-PC3-092-m01</td>
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<table>
<thead>
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<td>lecturer of lecture “Quantenchemie”</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<th>Module level</th>
<th>Other prerequisites</th>
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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**

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

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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)

--
### Module title
Physical Chemistry 4: Statistical Thermodynamics

### Abbreviation
08-PC4-092-m01

### Module coordinator
Lecturer of lecture "Statistische Thermodynamik"

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

### ECTS
3

### 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
This module deals with basics of statistical thermodynamics.

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

Der/Die Studierende verfügt über Grundlagenkenntnisse der Statistischen Thermodynamik und kann diese anwenden.

### 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: 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)

### 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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<td>Theoretical Models in Chemistry</td>
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<th>Module offered by</th>
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<tbody>
<tr>
<td>lecturer of lecture &quot;Quantenchemie&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td></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, mit Hilfe grundlegender Konzepte und Modelle angeregte Zustände von Molekülen zu beschreiben.

### Courses

German contents available but not translated yet.

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: 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)

### Allocation of places

--

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Basics of Natural Sciences
(21 ECTS credits)
<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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<tr>
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<tbody>
<tr>
<td>Managing Director of the Institute of Applied Physics</td>
<td>Faculty of Physics and Astronomy</td>
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<tbody>
<tr>
<td>2 semester</td>
<td>undergraduate</td>
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**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)
--
### Module title
**Practical Course Physics for Students of Non-physics-related Minor Subjects**

### Abbreviation
11-PFN-072-m01

### Module coordinator
Managing Director of the Institute of Applied Physics

### Module offered by
Faculty of Physics and Astronomy

### ECTS
3

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

### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
--

### 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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<tr>
<td>Biochemistry</td>
<td>08-BC-092-m01</td>
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<tbody>
<tr>
<td>holder of the Chair of Biochemistry</td>
<td>Chair of Biochemistry</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>
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<table>
<thead>
<tr>
<th>Duration</th>
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<th>Other prerequisites</th>
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<tbody>
<tr>
<td>2 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

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

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

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<td>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)</td>
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### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<table>
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<td>10-M-MCB-101-m01</td>
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<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>
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<td>Registration for the exercise must be made via SB@home at the beginning of the course or as announced by the lecturer in accordance with the specified registration deadlines. Certain prerequisites must be met to qualify for admission to assessment (e.g. successful completion of a certain percentage of exercises). The lecturer will inform students about the respective details at the beginning of the course. Registration for the exercise will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew and have to register anew, too.</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

<table>
<thead>
<tr>
<th>Type, number of weekly contact hours, language — if other than German</th>
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### Method of assessment

<table>
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<td>written examination (approx. 90 to 120 minutes)</td>
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### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)
Specialist Lab Course
(5 ECTS credits)
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<tr>
<td>head of the research group offering the module</td>
<td>Faculty of Chemistry and Pharmacy</td>
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<td>Where applicable, specific modules/module components as specified by supervisor (cf. Section 12 Subsection 4 FSB (subject-specific provisions)).</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</tr>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul bietet die Möglichkeit sich mit Hilfe der für den jeweiligen Fachbereich üblichen wissenschaftlichen Arbeitstechniken und Methoden vertieft in ein Forschungsthema einzuarbeiten.

**Intended learning outcomes**

The student is able to deeply acquaint himself/herself with a specific research topic, and to process and to present the results in a written report or a talk.

**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)

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<th>talk (approx. 15 minutes)</th>
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**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Thesis
(10 ECTS credits)
Module title | Abbreviation
--- | ---
Bachelor Thesis | 08-BA-102-m01

Module coordinator | Module offered by
head of the research group offering the module | Faculty of Chemistry and Pharmacy

<table>
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| 10 | numerical grade | Where applicable, specific modules/module components as specified by supervisor (cf. Section 16 Subsection 2 FSB (subject-specific provisions)).

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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</tr>
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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 (approx. 40 pages)
Language of assessment: German, English

Allocation of places
--

Additional information
Additional information on module duration: 8 weeks.

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Courses at partner university abroad
(50 ECTS credits)
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<tbody>
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<td>programme coordinator of the exchange programme</td>
<td>Faculty of Chemistry and Pharmacy</td>
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</table>

**Contents**

The topics covered in this module correspond to the syllabus of the foreign partner university.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden erwerben Kompetenzen entsprechend den besuchten Veranstaltungen an der Partneruniversität.

**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)

assessments according to examination regulations of the respective partner university

Language of assessment: German, English or language of instruction at the partner university

**Allocation of places**

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**Additional information**

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

--
Subject-specific Key Skills
(15 ECTS credits)
Compulsory Courses

(5 ECTS credits)
## 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

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

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<table>
<thead>
<tr>
<th>Module title</th>
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<td>Literature research methods</td>
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**Contents**

German contents available but not translated yet.

Literaturrecherche zur Planung der Experimente in der Anorganischen Chemie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über Kenntnisse der Literaturrecherche zur Planung der Experimente in der Anorganischen Chemie.

**Courses**

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

**Method of assessment**

2 literature searches about given preparations

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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Compulsory Electives

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<td>Advanced chemical practical course</td>
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<td>head of the research group offering the module</td>
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**Contents**

German contents available but not translated yet.

Das Modul bietet die Möglichkeit sich mit Hilfe der für den jeweiligen Fachbereich üblichen wissenschaftlichen Arbeitstechniken und Methoden vertieft in ein Forschungsthema einzuarbeiten.

**Intended learning outcomes**

The student is able to deeply acquaint himself/herself with a specific research topic, and to process and to present the results in a written report or a talk.

**Courses**

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

**Method of assessment**

Talk (approx. 15 minutes) or written report (approx. 10 to 20 pages)

Language of assessment: German, English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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<table>
<thead>
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<td>Applied Spectroscopy 3</td>
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### Contents

German contents available but not translated yet.

Das Modul bietet die Möglichkeit, das theoretische Wissen über spektroskopische Methoden praktisch umzusetzen und die erhaltenen Messwerte bzw. Graphen zu interpretieren. Im Detail werden UV/VIS-, Fluoreszenz- und Schwingungsspektren aufgenommen sowie analysiert. Im Modul werden zudem modernere Methoden der Massenspektrometrie behandelt.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, verschiedene Spektrometer zu bedienen und das erhaltene Spektrum zu interpretieren. Er/Sie kann eine Fehlerdiskussion durchführen.

### Courses

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

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

### Method of assessment

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

1 written examination (approx. 90 minutes) or 2 written examinations (approx. 60 or 90 minutes each) or 3 written examinations (approx. 60 minutes each) or oral examination of one candidate each (approx. 20 minutes) or 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
Programming course for Chemistry Major

### Abbreviation
08-PKC-102-m01

### Module coordinator
Lecturer of lecture "Programmierung für Chemiker"

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

### ECTS
5

### Method of grading
Only after successfully completed

### Duration
1 semester

### Course 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
The module introduces students to the basics of a programming language and gives applications to problems related to chemistry.

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

Die Studierenden können einfach Grundlagen der Programmiersprache beschreiben und auf chemierelevante Probleme anwenden.

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

### Method of assessment
practical examination: completion of programming exercises and oral description of algorithms used

Language of assessment: German, English

### Allocation of places
--

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

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Module title | Abbreviation
---|---
Biochemistry Lab | 08-BCP-092-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 | (not) successfully completed | 08-BC

Duration | Module level | Other prerequisites
1 semester | 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)
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)
pre/post-experiment examination talks (Vortestate and Nachtestate, approx. 15 minutes each), practical work (log, approx. 5 to 10 pages)
Assessment offered: once a year, summer semester

Allocation of places
Number of places: 24. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (80% of places): grade achieved in module 08-BC; among applicants with the same grade, places will be allocated by lot. Quota 2 (20% 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 1 (examination regulations for teaching-degree programmes)
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