Module Catalogue
for the Subject
Chemistry
as Unterrichtsfach
with the degree "Erste Staatsprüfung für das Lehramt an Mittelschulen"

Examination regulations version: 2013
Responsible: Faculty of Chemistry and Pharmacy
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<td>Thesis</td>
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Abbreviations used

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

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

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

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

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

\( \text{LASPO2009} \)

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

\( \text{25-Sep-2014 (2014-55)} \)

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.
Scientific Discipline

(54 ECTS credits)
Compulsory Courses

(54 ECTS credits)
<table>
<thead>
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<td>Physical Chemistry (teaching degree for secondary schools)</td>
<td>08-PC-GHR-102-m01</td>
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<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>lecturer of lecture &quot;Thermodynamik, Kinetik, Elektrochemie für Studierende der Biologie, Lebensmittelechemie and des Lehramtes Chemie GHR&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<th>ECTS</th>
<th>Method of grading</th>
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<tbody>
<tr>
<td>4</td>
<td>numerical grade</td>
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<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
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<tr>
<td>1 semester</td>
<td>undergraduate</td>
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**Contents**

This module deals with basics of thermodynamics, kinetics and electrochemistry.

**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**

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)

§ 42 (1) 1. Chemie "Allgemeine und Anorganische Chemie" und "Physikalische und Analytische Chemie"
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Organic Chemistry - laboratory course (teaching degree for secondary schools)</td>
<td>08-OC-Prakt-GHR-092-m01</td>
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</table>

**Module coordinator**
lecturers Organische Chemie (Organic Chemistry)
Institute of Organic Chemistry

**ECTS**
5

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

**Duration**
1 semester

**Module offered by**
Institute of Organic Chemistry

**Other prerequisites**
undergraduate

**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**
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

**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) 2. Chemie "Organische und Bioorganische Chemie"
**Module title**  
Basic Mathematics (teaching degree)

**Abbreviation**  
o8-PC-VKM-LA-102-m01

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<th>Method of grading</th>
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<tr>
<td>1 semester</td>
<td>undergraduate</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.

Der/Die Studierende erlernt den Umgang mit mathematischen Methoden. Er/Sie ist in der Lage, diese auf konkrete Fragestellungen in der Chemie anzuwenden.

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

**Method of assessment**
exercises (4 work sheets)  
Language of assessment: German or English

**Allocation of places**
--

**Additional information**
--

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

Exercises in Experimental Presentation

Abbreviation

08-Ch-GH-ÜIIV-092-m01

Module coordinator

lecturers of the three lectures offered in this module

Module offered by

Faculty of Chemistry and Pharmacy

ECTS

6

Method of grading

(not) successfully completed

Only after succ. compl. of module(s)

Duration

1 semester

Module level

undergraduate

Other prerequisites

--

Contents

German contents available but not translated yet.

Im Rahmen dieses Moduls werden von den Studierenden Vorträge mit Demonstrationen auf verschiedenen Gebieten der Chemie konzipiert, vorbereitet und präsentiert.

Intended learning outcomes

German intended learning outcomes available but not translated yet.


Courses

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

- 08-Ch-LA-ÜIIV-1-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 08-Ch-LA-ÜIIV-2-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 08-Ch-GH-ÜIIV-3-092: 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-Ch-LA-ÜIIV-1-092: Exercises in Experimental Presentation (Inorganic Chemistry)

- 2 ECTS, Method of grading: (not) successfully completed
- talk with demonstrations (approx. 45 minutes)
- Assessment offered: once a year, winter semester
- Language of assessment: German or English

Assessment in module component 08-Ch-LA-ÜIIV-2-092: Exercises in Experimental Presentation (Organic Chemistry)

- 2 ECTS, Method of grading: (not) successfully completed
- talk with demonstrations (approx. 45 minutes)
- Assessment offered: once a year, winter semester
- Language of assessment: German or English

Assessment in module component 08-Ch-GH-ÜIIV-3-092: Exercises in Experimental Presentation (Physical Chemistry) for Primary School and Secondary Public School Teachers

- 2 ECTS, Method of grading: (not) successfully completed
- talk with demonstrations (approx. 45 minutes)
- Assessment offered: once a year, winter semester
- Language of assessment: German or English
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<tr>
<th>Allocation of places</th>
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<tr>
<td>Additional information</td>
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<tr>
<td><strong>Referred to in LPO I</strong> (examination regulations for teaching-degree programmes)</td>
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<tr>
<td>§ 42 (1) 3. Chemie &quot;Übungen im Vortragen mit Demonstrationen&quot;</td>
<td></td>
</tr>
</tbody>
</table>
Module title | Abbreviation
--- | ---
Organic Chemistry 1 (teaching degree for secondary schools) | 08-OC1-GHR-092-m01

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

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<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
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<tr>
<td>6</td>
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</table>

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: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)
Language of assessment: German or English

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
§ 42 (1) 2. Chemie "Organische und Bioorganische Chemie"
### Module title
Organic Chemistry 2 (teaching degree for secondary schools)

### Abbreviation
08-OC2-GHR-092-m01

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

### Module offered by
Institute of Organic Chemistry

### ECTS
7

### Method of grading
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.


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

Language of assessment: German or English

## 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)

Language of assessment: German or English

## Allocation of places
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## Additional information
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## Referred to in LPO I
§ 42 (1) 2. Chemie "Organische und Bioorganische Chemie"
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<th><strong>Module title</strong></th>
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<tr>
<th><strong>Module coordinator</strong></th>
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<tbody>
<tr>
<td>holder of the Chair of Biochemistry</td>
<td>Chair of Biochemistry</td>
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<th><strong>Duration</strong></th>
<th><strong>Module level</strong></th>
<th><strong>Other prerequisites</strong></th>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<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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### 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 cellulären Systemen zu beschreiben**

### 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)

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)

§ 42 (1) 2. Chemie "Organische und Bioorganische Chemie"
### Module Catalogue for the Subject Chemistry

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#### Module coordinator

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<th>Other prerequisites</th>
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<tr>
<td>20</td>
<td>numerical grade</td>
<td>undergraduate</td>
<td>By way of exception, additional prerequisites are listed in the section on assessments.</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

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

- **08-AC1-1-102**: V + V + Ü (no information on SWS (weekly contact hours) and course language available)
- **08-AC1-LA-2-102**: P (no information on SWS (weekly contact hours) and course language available)
- **08-AC1-LA-3-102**: 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-AC1-1-102:** Principles of Inorganic Chemistry Principles of Inorganic Chemistry 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).

**Assessment in module component 08-AC1-LA-2-102:** Inorganic and Analytical Chemistry (lab) (teaching degree)
- 7 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-AC1-LA-3-102:** Inorganic Chemistry 1 (accompanying lecture) (teaching degree)
- 3 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

**Allocation of places**

**Additional information**

**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"
Teaching
(12 ECTS credits)
# Module Catalogue for the Subject Chemistry

## LA Mittelschulen

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<td>Experiments in Chemical Education</td>
<td>08-FD-ExUnt-092-m01</td>
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<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>holder of the Professorship of Didactics of Chemistry</td>
<td>Institute of Inorganic Chemistry</td>
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<table>
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<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
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<td>5</td>
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<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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## Contents

German contents available but not translated yet.

Das Modul vermittelt experimentelle Fähigkeiten und Fertigkeiten und ihren Einsatz bei der Unterrichtsplanung.

## 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-FD-ExUnt-1-092**: Ü (no information on SWS (weekly contact hours) and course language available)
- **08-FD-ExUnt-2-092**: S (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-FD-ExUnt-1-092**: Experiments in Chemical Teaching at Primary and Secondary Public Schools

- 4 ECTS, Method of grading: numerical grade
- presentation with demonstration (approx. 30 minutes)
- Language of assessment: German or English

**Assessment in module component 08-FD-ExUnt-2-092**: Planning of Teaching Units

- 1 ECTS, Method of grading: numerical grade
- presentation (approx. 20 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)

§ 36 (1) 7. Didaktik der Grundschule Chemie
§ 38 (1) 1. Didaktik der Hauptschule Chemie
§ 38 (1) 1. Didaktik der Mittelschule Chemie
§ 42 Chemie Fachdidaktik
## Chemistry Education: Educational Theory and Models of Teaching Concepts

<table>
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<th>Module title</th>
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<tr>
<td>Chemistry Education: Educational Theory and Models of Teaching Concepts</td>
<td>08-FD-Ch-BM-092-m01</td>
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<td>Institute of Inorganic Chemistry</td>
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<tbody>
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<td>1 semester</td>
<td>undergraduate</td>
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### Contents

German contents available but not translated yet.

Das Modul führt in die Grundlagen der Fachdidaktik Chemie ein.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über Grundkenntnisse fachdidaktischer Theorien und Modelle sowie Kenntnisse über Voraussetzungen, Ziele und Rahmenbedingungen des Fachunterrichts Chemie.

### Courses

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

- 08-FD-Einf-1-092: V (no information on SWS (weekly contact hours) and course language available)
- 08-FD-Ch-BM-2-092: S (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-FD-Einf-1-092: Introduction in Chemistry Education

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

#### Assessment in module component 08-FD-Ch-BM-2-092: Introduction in Chemistry Education (accompanying seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 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)

- § 36 (1) 7. Didaktik der Grundschule Chemie
- § 38 (1) 1. Didaktik der Hauptschule Chemie
- § 38 (1) 1. Didaktik der Mittelschule Chemie
- § 42 Chemie Fachdidaktik
- § 62 (1) 6. Chemie Didaktik
### Module Catalogue for the Subject
Chemistry
LA Mittelschulen

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Concepts of Teaching Chemistry</td>
<td>08-FD-SchulUms-092-m01</td>
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<th>Module offered by</th>
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<tbody>
<tr>
<td>holder of the Professorship of Didactics of Chemistry</td>
<td>Institute of Inorganic Chemistry</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

### Contents

German contents available but not translated yet.

Das Modul vermittelt Inhalte und Umsetzung von Chemieunterricht an Grund- und Hauptschulen.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

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

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

### Method of assessment

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

Testat (exam, approx. 20 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)

§ 36 (1) 7. Didaktik der Grundschule Chemie
§ 38 (1) 1. Didaktik der Hauptschule Chemie
§ 38 (1) 1. Didaktik der Mittelschule Chemie
§ 42 Chemie Fachdidaktik
Freier Bereich (general as well as subject-specific electives) (0-15 ECTS credits)

Teaching degree students must take modules worth a total of 15 ECTS credits in the area Freier Bereich (general as well as subject-specific electives) (Section 9 LASPO (general academic and examination regulations for teaching-degree programmes)). To achieve the required number of ECTS credits, students may take any modules from the areas below.

Freier Bereich -- interdisciplinary: The interdisciplinary additional offer for a teaching degree can be found in the respective Annex "Ergänzende Bestimmungen für den "Freien Bereich" im Rahmen des Studiums für ein Lehramt".
Subject-specific Extra Skills

(ECTS credits)

(Freier Bereich (general as well as subject-specific electives) -- subject specific)
## 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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## Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
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<td>Physical Chemistry 4: Statistical Thermodynamics</td>
<td>08-PC4-092-m01</td>
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<tr>
<td>lecturer of lecture &quot;Statistische Thermodynamik&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</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>

**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)

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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)
Module title

Physical and Theoretical Chemistry 3: Symmetry and Quantum Chemistry

Abbreviation

08-PC3-092-m01

Module coordinator

lucifer of lecture "Quantenchemie"

Module offered by

Institute of Physical and Theoretical Chemistry

ECTS

6

Method of grading

Only after succ. compl. of module(s)

numerical grade

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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

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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<td>Practical spectroscopy 1 (teaching degree for secondary schools)</td>
<td>08-OC-Spec-LAGY-092-m01</td>
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<td>Institute of Organic Chemistry</td>
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**Contents**

German contents available but not translated yet.

Das Modul führt in die spektroskopischen Methoden der Infrarotspektroskopie, Massenspektrometrie und NMR-Spektroskopie ein.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden können wichtige spektroskopische Methoden darstellen sowie ein Spektrum auswerten und Rückschlüsse auf die Molekülstruktur ziehen.

**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)

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

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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

§ 62 (1) 2. Chemie "Organische und Bioorganische Chemie"
### Module title
Practical spectroscopy 2 (teaching degree for secondary schools)

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<td>08-AC2-PS-LA-102-m01</td>
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### Module coordinator
lecturer of lecture "Praktische Spektroskopie 2"

### Module offered by
Institute of Inorganic Chemistry

### ECTS
3

### Method of grading
numerical grade

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

Language of assessment: German or English

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

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<td>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.

Der/Die Studierende kann die Struktur und Eigenschaften von Metallen, Legierungen und salzartigen Verbindungen fachgerecht darstellen. Er/Sie ist in der Lage, diese zu systematisieren und in Bezug auf Struktur und Reaktivität zu charakterisieren.

**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)

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

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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

§ 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"
## Module title
Elemental Organic Chemistry (teaching degree for secondary schools)

## Abbreviation
08-AC3-LA-102-m01

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

### Module offered by
Institute of Inorganic Chemistry

### ECTS
4

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
08-AC1 (module component 08-AC1-4 only) and 08-OC3 (module component 08-OC3-2 only)

### 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 vermittelt vertiefendes Wissen über Organometalle. Schwerpunkte sind Stuktur und Eigenschaften, Spezielle Stoffklassen, Reaktivität und Technische Prozesse.

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

Der/Die Studierende kann die Struktur und Eigenschaften von Organometallen fachgerecht darstellen. Er/Sie ist in der Lage, diese zu systematisieren und in Bezug auf Struktur und Reaktivität zu charakterisieren. Zudem kann er/sie Syntheseprinzipien für elementorganische Verbindungen entwickeln und erklären.

## 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)

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)
## Module title
Preparation of Exams Chemistry

## Abbreviation
08-FBC2-PV-101-m01

### Module coordinator
Lecturers Inorganic and Organische Chemie (Organic Chemistry)

### Module offered by
Faculty of Chemistry and Pharmacy

### ECTS
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### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
--

## Contents
Repetition of relevant topics and work on selected state examination issues in Inorganic and Organic Chemistry.

## Intended learning outcomes
The student is able to solve selected state examination issues of the previous years in Inorganic and Organic Chemistry.

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

- 08-FBC2-PV-1-101: S (no information on SWS (weekly contact hours) and course language available)
- 08-FBC2-PV-2-101: 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)

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-FBC2-PV-1-101: Preparation of Exams Inorganic Chemistry**
- 2 ECTS, Method of grading: (not) successfully completed
- successful participation in the form of short presentations on selected assignments
- Assessment offered: once a year, summer semester
- Language of assessment: German or English

**Assessment in module component 08-FBC2-PV-2-101: Preparation of Exams Organic Chemistry**
- 3 ECTS, Method of grading: (not) successfully completed
- successful participation in the form of short presentations on selected assignments
- Assessment offered: once a year, summer semester
- Language of assessment: German or English

## Allocation of places
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## Additional information
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## Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
<thead>
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<tr>
<td>Organic Chemistry 4 - advanced course</td>
<td>08-OC4-LAGY-102-m01</td>
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<td>Institute of Organic Chemistry</td>
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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** *(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: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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

§ 62 (1) 2. Chemie "Organische und Bioorganische Chemie"
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<tbody>
<tr>
<td>Guidance in Self-reliant Scientific Work</td>
<td>08-FD-WPF-WA-092-m01</td>
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**Contents**

German contents available but not translated yet.

Anleitung zum selbständigen wissenschaftlichen Arbeiten.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende ist in der Lage, ausgewählte Themenstellungen auf dem Gebiet der Chemiedidaktik auf wissenschaftlicher Basis selbständig zu bearbeiten. Dabei werden neben der Widerspiegelung des aktuellen Forschungsstandes Ansätze zur dynamischen Weiterentwicklung erarbeitet.

**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)

presentation (approx. 30 minutes)

Language of assessment: German or English

**Allocation of places**

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**Additional information**

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

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<table>
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<td>Preparation of Exams (Primary and Secondary Public Scholl Teachers)</td>
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</table>

**Contents**

German contents available but not translated yet.

Bearbeitung ausgewählter Staatsexamensthemen.

**Intended learning outcomes**

The student is able to solve selected state examination issues of the previous years.

**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)

written examination (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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<th>Abbreviation</th>
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<tbody>
<tr>
<td>Extracurricular Sites</td>
<td>08-FD-WPF-LLL-092-m01</td>
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<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
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<tbody>
<tr>
<td>holder of the Professorship of Didactics of Chemistry</td>
<td>Institute of Inorganic Chemistry</td>
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<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>4</td>
<td>(not) successfully completed</td>
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<tr>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
<td>--</td>
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</table>

### Contents

German contents available but not translated yet.

Das Modul behandelt Möglichkeiten und Grenzen der Einbeziehung außerschulischer Lernorte in den Chemieunterricht.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Der/Die Studierende ist in der Lage, außerschulische Lernorte, insbesondere Arbeiten in Schülerlaboren, zielführend in die Planung von Chemieunterricht einzubeziehen. Er/Sie kann diese Planungen in Schülerversuchen und deren aktive Betreuung umsetzen.

### 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-FD-WPF-LLL-1-092: S (no information on SWS (weekly contact hours) and course language available)
- 08-FD-WPF-LLL-2-092: 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-FD-WPF-LLL-1-092: Opportunities of Extracurricular Sites**

- 2 ECTS, Method of grading: (not) successfully completed
- presentation of a project (approx. 30 minutes)
- Language of assessment: German or English

**Assessment in module component 08-FD-WPF-LLL-2-092: School Lab**

- 2 ECTS, Method of grading: (not) successfully completed
- successful supervision of experiments in learn-teach-lab
- 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
Electronic structure and spectroscopy

### Abbreviation
08-PC-ESS-092-m01

### Module coordinator
lecturer of lecture "Elektronische Struktur and Spektroskopie" (Electronic Structure and Spectroscopy)

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

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<th>ECTS</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>numerical grade</td>
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</table>

### 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 vermittelt Grundlagenwissen in den Bereichen Atom- und Molekülbau sowie der Spektroskopie.

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

Der/Die Studierende kann die Kenntnisse des Atom- und Molekülbaus sowie die Grundlagen der Spektroskopie gezielt anwenden.

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

Language of assessment: German or English

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

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Theoretical Models in Chemistry (teaching degree for secondary schools)</td>
<td>08-TC-LA-092-m01</td>
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**Module coordinator**

lecturer of lecture "Quantenchemie"

**Module offered by**

Institute of Physical and Theoretical Chemistry

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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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**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** *(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: 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**

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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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<th>Module title</th>
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<td>Organic Chemistry 3 (teaching degree for secondary schools)</td>
<td>08-OC3-LA-102-m01</td>
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<tr>
<td>holder of the Professorship of Organic Chemistry</td>
<td>Institute of Organic 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>
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### Contents

The module focuses on polar rearrangements, olefination reactions, pericyclic reactions, carbenes, nitriles and radicals. It imparts basic knowledge of stereoselective synthesis, asymmetric catalysis, organometallic chemistry and retrosynthesis.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

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### Method of assessment

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### Language of assessment: German or English

### Allocation of places

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### Additional information

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

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**Thesis**

(10 ECTS credits)

Preparation of a written Hausarbeit (thesis) in accordance with the provisions of Section 29 LPO I (examination regulations for teaching-degree programmes) is a prerequisite for teaching degree students to be admitted to the Erste Staatsprüfung (First State Examination). In accordance with the provisions of Section 29 LPO I, students studying for a teaching degree Mittelschule may write this thesis in the subject Didaktik einer Fächergruppe der Mittelschule (Didactics of a Group of Subjects of Mittelschule), in the subject they selected as Unterrichtsfach (subject studied with a focus on the scientific discipline) or in the subject Erziehungswissenschaften (Educational Science). Pursuant to Section 29 Subsection 1 Sentence 2 LPO I, students may also choose to write an interdisciplinary thesis.
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Admission work (Chemistry for Secondary School Teachers)</td>
<td>08-Ch-HA-UF-HS-092-m01</td>
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<tbody>
<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.</td>
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### Contents

German contents available but not translated yet.

Selbstständige wissenschaftliche Bearbeitung eines gemäß § 29 LPO mit einer prüfungsberechtigen Dozentin/einem prüfungsberechtigten Dozenten vereinbarten Themas aus den Teilbereichen des Faches Chemie oder der Didaktik der Chemie.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

No courses assigned

### Method of assessment

Written thesis (Zulassungsarbeit, approx. 40 pages)

Language of assessment: German, exceptions in accordance with Section 29 LPO I (examination regulations for teaching degree programmes)

### 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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