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

Examination regulations version: 2016
Responsible: Faculty of Chemistry and Pharmacy
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### Subfield Other additional qualifications

- Tutoring 1 (practical course)  
- Tutoring 2 (practical course)  
- Foreign Studies (short)  
- Foreign Studies (long)  
- Chemistry-related competences outside of the Natural Sciences  
- Chemistry-related competences within the Natural Sciences  
- Chemistry-related competences outside of the Natural Sciences acquired abroad  
- Chemistry-related competences within the Natural Sciences acquired abroad  

### Thesis

- Master-Thesis Chemistry

### Compulsory Courses (double degree)

### Subfield Courses at partner university abroad

- Toxicology and legal studies  
- Advanced chemical practical course  

### Subfield Courses at partner university abroad

- Qualifications - Partner University

### Compulsory Electives (double degree)

### Inorganic Chemistry

- Compulsory Courses  
  - Advanced Inorganic Chemistry  
  - Inorganic Chemistry practical course for advanced  
- Compulsory Electives  
  - Basics and applications of quantum chemistry  
  - Bioinorganic Chemistry  
  - Solid state chemistry and inorganic materials  
  - Advanced organometallic chemistry and its application in homogeneous catalysis

### Organic Chemistry

- Compulsory Courses  
  - Modern Synthetic Methods  
  - Advanced Research Project Organic Chemistry  
- Compulsory Electives  
  - Organo- and Biocatalysis  
  - Practical course of clinical-analytical Chemistry  
  - Bioorganic Chemistry  
  - Supramolecular Chemistry (Basics)  
  - Basics and applications of quantum chemistry  
  - Modern Aspects of Natural Product Chemistry and Biological Chemistry  
  - Organic Functional Materials

### Physical Chemistry

- Compulsory Courses  
  - Laser Spectroscopy  
  - Advanced Physical Chemistry (Lab)  
  - Statistical Mechanics and Reaction Dynamics  
  - Physical Chemistry (Advanced Lab)  
- Compulsory Electives  
  - Material Science 1 (Basic introduction)  
  - Nanoscale Materials  
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<td>169</td>
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<tr>
<td>Thesis</td>
<td>30</td>
<td>178</td>
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<td>Compulsory Courses (double degree)</td>
<td>35</td>
<td>180</td>
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<tr>
<td>Subfield Courses at partner university abroad</td>
<td>5</td>
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<tr>
<td>Subfield Courses at partner university abroad</td>
<td>30</td>
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<tr>
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<td>Inorganic Chemistry</td>
<td>25 or 30</td>
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<tr>
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<tr>
<td>Compulsory Electives</td>
<td>5 or 10</td>
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<tr>
<td>Organic Chemistry</td>
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<td>Compulsory Courses</td>
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<td>Module</td>
<td>Compulsory Electives</td>
<td>Compulsory Courses</td>
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<tr>
<td>Physical Chemistry</td>
<td>10 or 15</td>
<td>25 or 30</td>
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<td>Compulsory Electives</td>
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<td>10 or 15</td>
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<td>Functional Materials</td>
<td>25 or 30</td>
<td>20</td>
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<td>Compulsory Courses</td>
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<td>5 or 10</td>
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<tr>
<td>Compulsory Electives</td>
<td></td>
<td></td>
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<td>Homogeneous Catalysis</td>
<td>25 or 30</td>
<td>20</td>
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<td>Compulsory Courses</td>
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<td>5 or 10</td>
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<tr>
<td>Compulsory Electives</td>
<td></td>
<td></td>
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<td>Medicinal Chemistry</td>
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<td>15 or 20</td>
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<td>Supramolecular Chemistry</td>
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<tr>
<td>Thesis</td>
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</table>
Content and Objectives of the Programme

The Master's program in Chemistry is offered by the Faculty of Chemistry and Pharmacy of the JMU as a fundamentally-oriented course with the degree of "Master of Science" (M.Sc.), in the context of a consecutive Bachelor's and Master's degree program.

The Master's course prepares students for scientific as well as doctoral work in chemistry and the eventual award of the degree Dr. rer. nat. The aim of the training is to provide students with in-depth knowledge of scientific work in the research and application of chemistry and the associated basic concepts. Through the education and training of analytical thinking, students should acquire the ability to independently apply the basic knowledge obtained earlier in their Bachelor studies and to transfer it to, and later familiarize themselves with, a wide variety of new tasks.

Through the thesis, students should show that they are able to deal with an experimental or theoretical task in a thematically-limited extent using known methods and from a scientific point of view. The Master's examination intends to determine whether the candidate or the candidate has an overview of the relationships in chemistry, and has the ability to apply the learned scientific methods. It allows the acquisition of an internationally comparable degree in the field of chemistry and provides a professional qualification to prepare for future work in research and development.
Abbreviations used

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

Term: SS = summer semester, WS = winter semester

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

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

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

Conventions

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

Notes

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

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

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

In accordance with

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

ASPO2015

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

15-Dec-2015 (2015-257)

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

Students must take three focuses (focuses 1 through 3 pursuant to Section 3 Subsection 2 Sentence 2 FSB (subject-specific provisions)) worth 25 ECTS credits each; provisions on available combinations are set out in Section 3 Subsection 2 Sentence 8 FSB.
Inorganic Chemistry

(25 ECTS credits)
Compulsory Courses

(20 ECTS credits)
### Module title
Advanced Inorganic Chemistry

### Abbreviation
08-ACM1-161-m01

### Module coordinator
Managing Director of the Institute of Inorganic Chemistry

### Module offered by
Institute of Inorganic Chemistry

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>numerical grade</td>
<td>--</td>
</tr>
</tbody>
</table>

### Duration
2 semester

### Module level
graduate

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

Das Modul behandelt spezifische Themen der Hauptgruppen- und Übergangsmetallchemie. Schwerpunkte sind spezielle Verbindungen der Hauptgruppenelemente (HGE), Bindungssituation in HGE und HGE-Verbindungen, Stoffchemie der Übergangsmetalle und Koordinationschemie.

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

Die Studierenden sind in der Lage, spezielle Verbindungen der Hauptgruppenelemente zu charakterisieren und erklären. Er/Sie kann stoffchemische Eigenschaften von Übergangsmetallen beschreiben und Struktur sowie chemische und physikalische Aspekte von Koordinationsverbindungen analysieren.

### Courses
S (3) + S (3)

### Method of assessment
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

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

--
### Module title
Inorganic Chemistry practical course for advanced

### Abbreviation
08-ACPM-161-m01

### Module coordinator
focus point coordinator "Inorganic Chemistry"

### Module offered by
Institute of Inorganic Chemistry

### ECTS
10

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

### Duration
(10) successfully completed --

### Module level
graduate --

### Other prerequisites
--

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

Das Modul vertieft spezielle Synthese- und Analysemethoden der anorganischen Chemie. Im Schwerpunkt steht das Arbeiten unter Inertgas, Reinigungsmethoden, Spektrenanalyse sowie Kristallographie. Die Studierenden arbeiten selbständig im Labor, halten ihre Forschungsergebnisse in einem Praktikumsbericht fest und präsentieren diese in einem Vortrag.

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

Die Studierenden sind in der Lage, anspruchsvolle anorganische Synthese- und Analysemethoden experimentell durchzuführen sowie die erhaltenen Ergebnisse auszuwerten. Er/Sie kann Forschungsergebnisse in einem wissenschaftlichen Bericht formulieren und in einem Vortrag präsentieren.

### Courses
(type, number of weekly contact hours, language — if other than German)
P (24)

Module taught in: German or English

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

report on practical course (approx. 20 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

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

--
Compulsory Electives

(5 ECTS credits)
## Bioinorganic Chemistry

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Bioinorganic Chemistry</td>
<td>08-ACM2-161-M01</td>
</tr>
</tbody>
</table>

### Module coordinator

Lecturer of seminar "Anorganische Aspekte der Biochemie and Medizinischen Chemie" (Inorganic Aspects of Biochemistry and Medicinal Chemistry)

### Module offered by

Institute of Inorganic Chemistry

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

### Duration

1 semester

### Contents

German contents available but not translated yet.

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

### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

(S, 3)

Module taught in: German or English

### Method of assessment

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid state chemistry and inorganic materials</td>
<td>08-ACM3-161-m01</td>
</tr>
</tbody>
</table>

**Module coordinator**

Lecturer of seminar "Festkörperchemie and Anorganische Materialien" (Solid State Chemistry and Inorganic Materials)

**Module offered by**

Institute of Inorganic Chemistry

**ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** |
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</table>

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

**Contents**

German contents available but not translated yet.

Das Modul führt in die Festkörperchemie ein. Schwerpunkte sind Struktur, chemische und physikalische Eigenschaften, Synthesemethoden sowie ausgewählte Materialien von Festkörpern.

**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 (3)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Advanced organometallic chemistry and its</td>
<td>08-HKM2-161-m01</td>
</tr>
<tr>
<td>application in homogeneous catalysis</td>
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</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecturer of the seminar &quot;Spezielle Metallorganische Chemie und deren Anwendung in der Homogenkatalyse&quot;</td>
<td>Institute of Inorganic Chemistry</td>
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<th>Method of grading</th>
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<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
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<tbody>
<tr>
<td>1 semester</td>
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<tr>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>German contents available but not translated yet.</td>
</tr>
<tr>
<td>Das Modul bietet die Möglichkeit, Elementorganische Verbindungen der Übergangsmetalle mit homogenkatalytischen Anwendungen im Detail zu betrachten.</td>
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</table>

<table>
<thead>
<tr>
<th>Intended learning outcomes</th>
</tr>
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<tbody>
<tr>
<td>German intended learning outcomes available but not translated yet.</td>
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<tr>
<th>Courses (type, number of weekly contact hours, language — if other than German)</th>
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<tr>
<td>S (3)</td>
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<tr>
<td>Module taught in: German or English</td>
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<table>
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<th>Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)</th>
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<tbody>
<tr>
<td>a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)</td>
</tr>
<tr>
<td>Language of assessment: German and/or English</td>
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<table>
<thead>
<tr>
<th>Allocation of places</th>
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<table>
<thead>
<tr>
<th>Additional information</th>
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<table>
<thead>
<tr>
<th>Referred to in LPO I (examination regulations for teaching-degree programmes)</th>
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</tbody>
</table>
Organic Chemistry
(25 ECTS credits)
Compulsory Courses
(15 ECTS credits)
Module title | Abbreviation
---|---
Modern Synthetic Methods | 08-OCM-SYNT-161-m01

| Module coordinator | Module offered by |
---|---
I lecturer of the seminar | Institute of Organic Chemistry |

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

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

**Contents**

German contents available but not translated yet.

Das Modul behandelt moderne stereoselektive Synthesemethoden. Schwerpunkt sind ausgewählte Totalsynthesen, Organometallchemie und Katalyse.

**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 (2) + Ü (1)

Module taught in: German or English

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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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<tr>
<td>Advanced Research Project Organic Chemistry</td>
<td>08-OCM-AKP1-161-m01</td>
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<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>head of the research group offering the module</td>
<td>Institute of Organic Chemistry</td>
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<table>
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<tr>
<th>Duration</th>
<th>Module level</th>
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<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</tbody>
</table>

### Contents

German contents available but not translated yet.

Das Modul bietet den Studierenden die Möglichkeit, in einem Arbeitskreis des Instituts für Organische Chemie mit zu arbeiten sowie spezifische Synthese- und Analysemethoden kennen zu lernen.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, arbeitskreistypische synthetische, analytische und theoretische forschungsrelevante Inhalte zu beschreiben sowie anzuwenden.

### Courses

P (20)

Module taught in: German or English

### Method of assessment

Log (approx. 15 to 20 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Compulsory Electives
(10 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modern Aspects of Natural Product Chemistry and Biological Chemistry</td>
<td>08-OCM-NAT-161-m01</td>
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</table>

**Module coordinator**

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
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**Duration**

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

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezielle Themen der Naturstoffchemie und Biologischer Chemie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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

**Courses**

S (3)

Module taught in: German or English

**Method of assessment**

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

MA Chemie: unbegrenzt, Ma Biochemie: 20 places. Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

""

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
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<td>Organic Functional Materials</td>
<td>08-OCM-FM-161-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecturer of the seminar &quot;Organische Funktionsmaterialien&quot;</td>
<td>Institute of Organic Chemistry</td>
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</table>

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

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezifische Themen der organischen Funktionsmaterialien. Schwerpunkte sind grundlegende physikalische Effekte, organische Festkörper, Anwendung organischer Funktionsmaterialien und organische und metallorganische Polymerchemie.

**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 (3)

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
## Module title
Organic- and Biocatalysis

## Abbreviation
08-HKM1-152-m01

## Module coordinator
Lecturer of the seminar "Organic- and Biocatalysis"

## Module offered by
Faculty of Chemistry and Pharmacy

## ECTS
5

## Method of grading
Numerical grade

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

## Duration
1 semester

## Module level
Graduate

## Other prerequisites
--

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


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


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

S (3)

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

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

--
### Module title
Supramolecular Chemistry (Basics)

### Abbreviation
08-SCM1-152-m01

### Module coordinator
Lecturer of lecture "Organischen Chemie"

### ECTS
5

### Method of grading
Numerical grade

### Degree of module
Graduate

### Other prerequisites
--

### Duration
1 semester

### Content
German content available but not translated yet.


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


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

S (3)

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

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

--
### Module title
Bioorganic Chemistry

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>08-SCM3-152-m01</th>
</tr>
</thead>
</table>

### Module coordinator
lecturer of lecture "Bioorganische Chemie" (Bioorganic Chemistry)

### Module offered by
Institute of Organic Chemistry

### ECTS
5

### Method of grading
numerical grade

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

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

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


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


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

<table>
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<th>S (3)</th>
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### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

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

--
Module title: Basics and applications of quantum chemistry
Abbreviation: 08-TCM2-161-m01

Module coordinator: Lecturer of lecture "Computational Chemistry"
Module offered by: Institute of Physical and Theoretical Chemistry

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

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

Contents:
The module introduces students to computational chemistry.

Intended learning outcomes:
Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

Courses:
S (2) + Ü (2)

Method of assessment:
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)
Language of assessment: German and/or English

Allocation of places:
--

Additional information:
--

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

(25 ECTS credits)
Compulsory Courses

(10 ECTS credits)
### Module Catalogue for the Subject Chemistry

Master’s with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Laser Spectroscopy</td>
<td>08-PCM1a-161-m01</td>
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<tbody>
<tr>
<td>lecturer of seminar &quot;Laserspektroskopie&quot; (Laser Spectroscopy)</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
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</table>

### Contents

German contents available but not translated yet.

Das Modul führt in die Grundlagen der Laserspektroskopie ein. Als experimentelle Methoden werden die Absorptions- und Emissionsspektroskopie behandelt.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, Aufbau und Funktionsweise eines Lasers sowie die optischen Grundlagen zu erklären. Er/Sie kann das Prinzip der Absorptions- und Emissionsspektroskopie darstellen.

### Courses

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

S (2) + Ü (1)
Module taught in: German or English

### Method of assessment

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)
Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
## Module Catalogue for the Subject
### Chemistry
#### Master's with 1 major, 120 ECTS credits

<table>
<thead>
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<th>Module title</th>
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<tr>
<td>Advanced Physical Chemistry (Lab)</td>
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<thead>
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<tbody>
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<tbody>
<tr>
<td></td>
<td>graduate</td>
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</tbody>
</table>

### Contents

German contents available but not translated yet.


### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden können moderne experimentelle Methoden der Physikalischen Chemie sicher praktisch durchführen. Er/Sie kann erhaltene Messwerte inhaltlich und graphisch mit geeigneten Computerprogrammen sowie rechnerisch analysieren und in einem wissenschaftlichen Protokoll formulieren.

### Courses

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

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<td>German or English</td>
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</table>

### Method of assessment

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Compulsory Electives
(15 ECTS credits)
Module title | Abbreviation
--- | ---
Statistical Mechanics and Reaction Dynamics | 08-PCM2-161-m01

Module coordinator | Module offered by
lecturer of seminar "Chemische Dynamik" (Chemical Dynamics) | Institute of Physical and Theoretical Chemistry

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

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

Contents
The module deals with selected contents of statistical mechanics and reaction dynamics. It introduces the basic principles of statistical thermodynamics and conveys the transition state theory. Other topics are uni- and bimolecular reactions as well as charge and energy transfer.

Intended learning outcomes
The students are familiar with selected contents of statistical mechanics and reaction dynamics. They know the basic principles of statistical thermodynamics and can apply them.

Courses (type, number of weekly contact hours, language — if other than German)
S (2) + Ü (1)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)
Language of assessment: German and/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>Nanoscale Materials</td>
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<tbody>
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<td>lecturer of the seminar &quot;Nanoskalige Materialien&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, nanoskalige Materialien zu charakterisieren. Er/Sie kann Analysenmethoden sowie Anwendungsgebiete nanoskaliger Materialien anführen.

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

S (2) + Ü (1)

Module taught in: German or English

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)

Language of assessment: German and/or English

creditable for bonus

**Allocation of places**

--

**Additional information**

--

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

--
Module title | Abbreviation
---|---
Ultrafast spectroscopy and quantum-control | 08-PCM4-161-m01

| Module coordinator | Module offered by |
---|---
I lecturer of the seminar "Nanoskalige Materialien" | Institute of Physical and Theoretical Chemistry

| ECTS | Method of grading | Duration | Module level | Other prerequisites |
---|---|---|---|---
5 | numerical grade | 1 semester | graduate | Prior completion of modules 08-PCM1a and 08-PCM1b recommended.

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezielle Themen der Ultrakurzzeitspektroskopie und Quantenkontrolle. Schwerpunkte sind ultrakurze Laserimpulse, zeitaufgelöste Laserspektroskopie sowie kohärente Kontrolle.

**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 (2) + Ü (1) | German or English

Module taught in: German or English

**Method of assessment**

| Type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus |
---|---|---|
a) written examination (approx. 90 minutes) | German and/or English | no
b) oral examination of one candidate each (approx. 20 minutes) | no
c) talk (approx. 30 minutes) | no

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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<table>
<thead>
<tr>
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<th>Abbreviation</th>
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<td>Physical chemistry of supramolecular assemblies</td>
<td>08-PCM5-161-m01</td>
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<td>lecturer of the seminar &quot;Physikalische Chemie Supramolekularer Strukturen&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<tbody>
<tr>
<td>1 semester</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul betrachtet im Detail die grundlegenden Wechselwirkungen zwischen Molekülen. Es werden Bildung und physikalische-chemische Eigenschaften von Aggregaten besprochen. Wichtige Anwendungen supramolekularer Chemie werden thematisiert.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

<table>
<thead>
<tr>
<th>type, number of weekly contact hours, language</th>
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<tbody>
<tr>
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**Module taught in:** German or English

**Method of assessment**

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<th>examination offered — if not every semester, information on whether module is creditable for bonus</th>
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<td>a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)</td>
<td>Language of assessment: German and/or English</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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<td>Physikalische Chemie (Physical Chemistry)</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul bietet den Studierenden die Möglichkeit, in einem Arbeitskreis des Instituts für Physikalische Chemie mit zu arbeiten sowie spezifische Synthese- und Analysemethoden kennen zu lernen.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden können für einen Arbeitskreis der Physikalischen Chemie typische Untersuchungsmethoden anwenden sowie die erhaltenen Ergebnisse analysieren um aktuelle Fragestellungen der Physikalischen Chemie zu beantworten.

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

P (4)

Module taught in: German or English

**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. 20 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Module title | Abbreviation
--- | ---
Selected topics in theoretical chemistry | 08-TCM1-161-m01

Module coordinator | Module offered by
lecturer of lecture "Theoretische Chemie" | Institute of Physical and Theoretical Chemistry

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

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

Contents
The module introduces students to theoretical chemistry.

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

Die Studierenden können mathematische und physikalische Grundlagen quantenchemischer und quantendynamischer Ansätze der Theoretischen Chemie darstellen.

Courses (type, number of weekly contact hours, language — if other than German)
S (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

Allocation of places
--

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Basics and applications of quantum chemistry</td>
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<tbody>
<tr>
<td>1 semester</td>
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</table>

Contents

The module introduces students to computational chemistry.

Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

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

| S (2) + Ü (2) |

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

Allocation of places

--

Additional information

--

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

--
Biochemistry
(25 ECTS credits)
Compulsory Courses

(15 ECTS credits)
<table>
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<tr>
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<td>Chair of Biochemistry</td>
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<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**
The module covers specific topics of molecular physiology and functional biochemistry in lectures and exercises.

**Intended learning outcomes**
After attending the module events, students have solid knowledge in molecular biology.

**Courses** (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)
Language of assessment: German and/or English

**Allocation of places**
--

**Additional information**
--

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

**Abbreviation**  08-BC-MOLP-152-m01

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

**Module offered by**  Faculty of Chemistry and Pharmacy

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**Duration**  1 semester

**Module level**  undergraduate

**Contents**

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

**Intended learning outcomes**

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

**Courses**

<table>
<thead>
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<th>Number of weekly contact hours</th>
<th>Language</th>
<th>Place of examination</th>
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</table>

**Method of assessment**

a) written examination (approx. 45 to 90 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (20 to 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 to 20 minutes per candidate) or e) presentation (20 to 30 minutes) or f) practical examination (on average approx. 2 hours; time to complete will vary according to subject area but will not exceed a maximum of 4 hours)

Assessment offered: Once a year, winter semester

Language of assessment: German and/or English

**Allocation of places**

Biochemie (Biochemistry), Bachelor’s: 24 places. Selection process Biochemie (Biochemistry), Bachelor’s (180 ECTS credits): Should the number of applications exceed the number of available places, places will be allocated according to the following quotas: Quota 1 (two thirds of places): current average grade of successfully completed modules; among applicants with the same average grade, places will be allocated by lot. Quota 2 (one third of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

Chemie (Chemistry), Master’s: 6 places. Selection process Chemie (Chemistry), Bachelor’s (120 ECTS credits): Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Compulsory Electives

(10 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Practical course &quot;Molecular Machines&quot; for advanced students</td>
<td>08-BC-VPMM-161-m01</td>
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</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>holder of the Chair of Biochemistry</td>
<td>Chair of Biochemistry</td>
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<tr>
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### Contents

German contents available but not translated yet.

Das Modul ermöglicht ein vertieftes Einarbeiten in ein Forschungsthema. Ausgewählte Methoden und Themen der Molekularbiologie und Biochemie; Klonierung, Mutagenese, Proteinexpression und -aufreinigung, RNA-Protein und Protein-Protein Interaktionsstudien, Isolierung und funktionelle Analyse von makromolekularen Komplexen.

### Intended learning outcomes

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

### Courses

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

P (10)

### Method of assessment

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

Log (approx. 20 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### 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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</thead>
<tbody>
<tr>
<td>Practical course &quot;Protein Degradation in Eukaryotes&quot; for advanced students</td>
<td>08-BC-VPPD-161-m01</td>
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<tbody>
<tr>
<td></td>
<td>graduate</td>
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</table>

### Contents

German contents available but not translated yet.

Das Modul ermöglicht ein vertieftes Einarbeiten in ein Forschungsthema auf dem Gebiet der Proteindegradation in Eukaryoten.

### Intended learning outcomes

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

### Courses

- **P (10)**

### Method of assessment

- **Log (approx. 20 pages) and talk (approx. 15 minutes)**
- Language of assessment: German and/or English

### Allocation of places

- --

### Additional information

- --

### Referred to in LPO I

- (examination regulations for teaching-degree programmes)
- --
Module title | Abbreviation
--- | ---
Practical course "RNA Biochemistry" for advanced students | 08-BC-VPRB-161-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)
--- | --- | ---
10 | numerical grade | 08-BC-MOLP

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

Contents

German contents available but not translated yet.


Intended learning outcomes

German intended learning outcomes available but not translated yet.

Der/Die Studierende beherrscht es, sich in ein Forschungsthema vertieft einzuarbeiten sowie die Ergebnisse im Rahmen eines Vortrags darzustellen. Der/Die Studierende ist in der Lage, mittels unterschiedlicher Methoden, verschiedene Mechanismen der allgemeinen und spezifischen Translationskontrolle entsprechend selbständig zu erarbeiten, die Ergebnisse fachgerecht aufzubereiten und verständlich zu präsentieren.

Courses (type, number of weekly contact hours, language — if other than German)
P (10)

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

Log (approx. 20 pages) and talk (approx. 15 minutes)
Language of assessment: German and/or English

Allocation of places

--

Additional information

--

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

--
Module title: Practical course "Structural Biology" for advanced students
Abbreviation: 08-BC-VPSB-161-m01

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

ECTS: 10
Method of grading: numerical grade
Only after succ. compl. of module(s): 08-BC-MOLP

Duration: graduate
Other prerequisites: --

Contents:
German contents available but not translated yet.

Das Modul beschäftigt sich mit der Frage nach Klonierung und Expression von Proteinkonstrukten für die Kristallisation. Es vermittelt die Grundlagen und Techniken der Kristallisation und Kristalloptimierung sowie der Kristallographischen Datensammlung.

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

Der/Die Studierende erwirbt ein Grundverständnis für die Herangehensweise bei der Wahl von Proteinkonstrukten für die Kristallisation. Er/Sie beherrscht nach Besuch der Modulveranstaltungen die grundlegenden Fertigkeiten und Techniken der Proteinkristallisation und Datensammlung/-verarbeitung.

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

P (10)

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

Log (approx. 20 pages) and talk (approx. 15 minutes)
Language of assessment: German and/or English

Allocation of places:
--

Additional information:
--

Referred to in LPO I:
(examination regulations for teaching-degree programmes)
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<th>Module title</th>
<th>Abbreviation</th>
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<td>Bioinorganic Chemistry</td>
<td>08-ACM2-161-m01</td>
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<th>Module offered by</th>
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</thead>
<tbody>
<tr>
<td>Lecturer of seminar &quot;Anorganische Aspekte der Biochemie und Medizinischen Chemie&quot; (Inorganic Aspects of Biochemistry and Medicinal Chemistry)</td>
<td>Institute of Inorganic Chemistry</td>
</tr>
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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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<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</tbody>
</table>

**Contents**

German contents available but not translated yet.

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

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

<table>
<thead>
<tr>
<th>S (3)</th>
<th>Module taught in: German or English</th>
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**Method of assessment**

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)
Module title
Organo- and Biocatalysis

Abbreviation
08-HKM1-152-m01

Module coordinator
Lecturer of the seminar "Organo- and Biokatalyse"

Module offered by
Faculty of Chemistry and Pharmacy

ECTS
5

Method of grading
Numerical grade

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

Duration
1 semester

Module level
Graduate

Other prerequisites
--

Contents
German contents available but not translated yet.


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


Courses
(type, number of weekly contact hours, language — if other than German)
S (3)

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

Allocation of places
--

Additional information
--

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

Modern Aspects of Natural Product Chemistry and Biological Chemistry

Abbreviation

08-OCM-NAT-161-m01

Module coordinator

Lecturer of the seminar

Module offered by

Institute of Organic Chemistry

ECTS

5

Method of grading

Numerical grade

Only after success completion of module(s)

Duration

1 semester

Module level

Graduate

Other prerequisites

--

Contents

German contents available but not translated yet.

Das Modul behandelt spezielle Themen der Naturstoffchemie und Biologischer Chemie.

Intended learning outcomes

German intended learning outcomes available but not translated yet.

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

Courses

S (3)

Module taught in: German or English

Method of assessment

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

Allocation of places

MA Chemie: unbegrenzt, Ma Biochemie: 20 places. Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.

Additional information

--

Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title | Abbreviation
--- | ---
Drug design | 08-MCM3-152-m01

Module coordinator
Lecturers Pharmazeutische Chemie (Pharmaceutical Chemistry)

Module offered by
Institute of Pharmacy and Food Chemistry

<table>
<thead>
<tr>
<th>ECTS</th>
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<tr>
<td>5</td>
<td>numerical grade</td>
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</tbody>
</table>

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

Contents
German contents available but not translated yet.


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

Courses (type, number of weekly contact hours, language — if other than German)
S (2) + Ü (1)
Module taught in: German or English

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 with discussion (approx. 30 minutes)
Language of assessment: German and/or English

Allocation of places
20 places. 4 places for students of the Master’s degree programme Chemie (Chemistry): Places will be allocated according to the same number of subject semesters; students who have chosen Medizinische Chemie (Medicinal Chemistry) as their focus will be given preferential consideration; among applicants with the same number of subject semesters, places will be allocated by lot.; 6 places for students of the Master’s degree programme Biochemie (Biochemistry): Places will be allocated according to the number of subject semesters; among applicants with the same number of subject semesters, places will be allocated by lot; a waiting list will be maintained and places re-allocated by lot as they become available.

Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Clinical-analytical Chemistry</td>
<td>08-PH-KAC-152-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecturer of lecture &quot;Klinisch-analytische Chemie&quot; (Clinical and Analytical Chemistry)</td>
<td>Institute of Pharmacy and Food Chemistry</td>
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<table>
<thead>
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<th>ECTS</th>
<th>Method of grading</th>
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<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

**Contents**

This module covers specific topics of clinical analytical chemistry.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über Fortgeschrittenkenntnisse der Molekularbiologie.

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

V (3)

**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. 120 minutes)
Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Module title: Practical course of clinical-analytical Chemistry

Abbreviation: 08-PH-KACP-152-m01

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

Module offered by: Institute of Pharmacy and Food Chemistry

ECTS: 5

Method of grading: Only after successfully completed module(s)

Duration: 1 semester

Module level: Undergraduate

Other prerequisites: --

Contents:

German contents available but not translated yet.

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

Intended learning outcomes:

German intended learning outcomes available but not translated yet.

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

Courses:

P (5)

Method of assessment:

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

Allocation of places: --

Additional information: --

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

---
Functional Materials
(25 ECTS credits)
Compulsory Courses
(20 ECTS credits)
# Module Catalogue for the Subject
## Chemistry
### Master's with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tr>
<td>Material Science 1 (Basic introduction)</td>
<td>08-FU-MaWi1-152-m01</td>
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<tr>
<td>holder of the Chair of Chemical Technology of Material Synthesis</td>
<td>Chair of Chemical Technology of Material Synthesis</td>
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<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</tbody>
</table>

## Contents


## Intended learning outcomes

The students possess comprehensive knowledge about various techniques form different areas of the field of chemical process engineering. For a given objective they are able to weigh the pros and cons of different techniques and can suggest ways of fabrication, processing and treatment of materials. Furthermore they are confident in handling of measurement data as well as statistical and systematic errors and possess extensive knowledge about nomenclature, significance as well as practically determining characteristic material properties.

## Courses

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

V (3) + Ü (1)

## Method of assessment

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

## Allocation of places

--

## Additional information

--

## Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
### Module Catalogue for the Subject Chemistry
#### Master’s with 1 major, 120 ECTS credits

<table>
<thead>
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<th>Module title</th>
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<td>Project Work</td>
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<th>Module offered by</th>
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<tbody>
<tr>
<td>head of the research group offering the module</td>
<td>Chair of Chemical Technology of Material Synthesis</td>
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<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Im Rahmen des Moduls erfolgt eine angeleitete vertiefte Einarbeitung in ein Forschungsthema sowie die Darstellung der erhaltenen Ergebnisse.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über spezielle Kenntnisse in der Durchführung materialwissenschaftlicher Experimente.

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

- **P (10)**

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

- Log (approx. 15 pages) and talk (approx. 15 minutes)
- Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Module title: Organic Functional Materials

Abbreviation: 08-OCM-FM-161-m01

Module coordinator:
Lecturer of the seminar "Organische Funktionsmaterialien"

Module offered by:
Institute of Organic Chemistry

ECTS: 5

Method of grading:
Numerical grade

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

Duration: 1 semester

Module level: Graduate

Other prerequisites: --

Contents:

German contents available but not translated yet.

Das Modul behandelt spezifische Themen der organischen Funktionsmaterialien. Schwerpunkte sind grundlegende physikalische Effekte, organische Festkörper, Anwendung organischer Funktionsmaterialien und organische und metallorganische Polymerchemie.

Intended learning outcomes:

German intended learning outcomes available but not translated yet.


Courses:

S (3)

Method of assessment:

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes

Language of assessment: German and/or English

Allocation of places:

--

Additional information:

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

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<table>
<thead>
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<th>Module offered by</th>
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<tbody>
<tr>
<td>lecturers specialisation subject Funktionsmaterialien (Functional Materials)</td>
<td>Chair of Chemical Technology of Material Synthesis</td>
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<th>Method of grading</th>
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<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</tbody>
</table>

**Contents**

German contents available but not translated yet.

Im Rahmen des Moduls werden zehn Experimente mit materialwissenschaftlichem Bezug aus einer größeren Auswahl durchgeführt.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über spezielle Kenntnisse in der Durchführung materialwissenschaftlicher Experimente.

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

P (8)

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Compulsory Electives

(5 ECTS credits)
### Module title
Material Science 2 (The Material Groups)

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Science 2</td>
<td>08-FU-MaWi2-152-m01</td>
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</table>

### Module coordinator
holder of the Chair of Chemical Technology of Material Synthesis

### Module offered by
Chair of Chemical Technology of Material Synthesis

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

### Contents

### Intended learning outcomes
The students acquire fundamental knowledge about fabrication and properties of the major classes of materials and are able to apply this to scientific problems.

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

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<tbody>
<tr>
<td>V (3) + Ü (1)</td>
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</table>

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

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

--
## Module title

Chemically and bio-inspired Nanotechnology for Material Synthesis

## Abbreviation

08-FU-NT-152-m01

<table>
<thead>
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<td>undergraduate</td>
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</tbody>
</table>

| Contents |

Synthesis methods and parameters in sol-gel chemistry as well as characterisation and application of created materials. Basic principles of bio-mineralisation, structure of biomaterials and introduction to bio-inspired materials synthesis.

| Intended learning outcomes |

The student possesses profound knowledge about sol-gel chemistry and biomineralisation.

| Courses (type, number of weekly contact hours, language — if other than German) |
| V (4) |

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

| Allocation of places |

--

| Additional information |

--

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

--
### Module title

**Molecular Materials (Lecture)**

**Abbreviation**

08-FU-MoMaV-152-m01

### Module coordinator

degree programme coordinator Funktionswerkstoffe (Functional Materials)

### Module offered by

Chair of Chemical Technology of Material Synthesis

### ECTS

5

### Method of grading

numerical grade

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

--

### Duration

1 semester

### Module level

undergraduate

### Other prerequisites

--

### Contents

Chemical bonds and molecular interactions, supramolecular chemistry, molecular materials, colloids, nano particles, thin films.

### Intended learning outcomes

The students gain fundamental knowledge in the relationships of physical, chemical and technological properties of materials and their structure. They understand the significance of various inter- and intramolecular interactions and how they determine the properties of molecular materials. They learn how to familiarize themselves with a scientific topic including a literature search, and how to give a presentation including discussion and feedback.

### Courses

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

V (3) + S (1)

### Method of assessment

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

[a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)] as well as talk (approx. 30 minutes), weighted 3:1

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
### Module Catalogue for the Subject Chemistry

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

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Polymer Chemistry 1 (Lecture and Practical Course)</td>
<td>03-FU-PM1-152-m01</td>
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</table>

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>holder of the Chair of Functional Materials in Medicine and Dentistry</td>
<td>Faculty of Medicine</td>
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</tbody>
</table>

**Contents**

Basic methods of polymerisation: free radical polymerisations, polyadditions, ionic polymerisations, controlled radical polymerisations; characterisation of polymers and polymer analytics: gel permeation chromatography, endgroup analysis, mass spectrometry, rheology.

**Intended learning outcomes**

The students acquire fundamentals of polymer chemistry and the related methods for their characterisation.

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

| V (2) + P (2) |

**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) assessment and b) Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations) Assessment offered: Once a year, winter semester Language of assessment: German and/or English creditable for bonus

**Allocation of places**

--

**Additional information**

--

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

--
### Module title
Polymers II

### Abbreviation
03-FU-PM2-161-m01

### Module coordinator
holder of the Chair of Functional Materials in Medicine and Dentistry

### Module offered by
Faculty of Medicine

### ECTS
5

### Method of grading
numerical grade

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

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
Deepeend polymer synthesis methods, special polymers (block copolymers, co-polymerization techniques, complex polymer architectures), biodegradable polymers, polypeptoides, natural polymers. We will discuss the application of the respective polymers: e.g. as biomaterials, for electrospinning, for the production of hydrogels and their behavior on surfaces.

### Intended learning outcomes
The student acquire advanced knowledge in polymer manufacturing, analysis and applications. This involves different synthetic routes with which the different molecules can be prepared from different starting materials. Students can estimate if and how fast a polymer degrades under given circumstances. Furthermore, they gain insight into the field of technically used polymers from nature. Each section also points to possible consequences / disadvantages that synthesis of the various polymers may have, thus drawing students' understanding to ethical concerns.

### Courses
(type, number of weekly contact hours, language — if other than German)
S (2) + Ü (1)

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)
Language of assessment: German and/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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<tr>
<td>Nanoscale Materials</td>
<td>08-PCM3-161-m01</td>
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<tbody>
<tr>
<td>lecturer of the seminar &quot;Nanoskalige Materialien&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, nanoskalige Materialien zu charakterisieren. Er/Sie kann Analysenmethoden sowie Anwendungsgebiete nanoskaliger Materialien anführen.

**Courses**

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

S (2) + Ü (1)

Module taught in: German or English

**Method of assessment**

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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<table>
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<td>Supramolecular Chemistry (Basics)</td>
<td>08-SCM1-152-m01</td>
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**Module coordinator**

Lecturer of lecture "Organischen Chemie"

**Module offered by**

Faculty of Chemistry and Pharmacy

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**Duration**

1 semester

**Module level**

graduate

**Other prerequisites**

--

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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

S (3)

**Method of assessment**

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)

Language of assessment: German and/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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<td>Solid state chemistry and inorganic materials</td>
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<th>Module offered by</th>
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<tr>
<td>lecturer of seminar &quot;Festkörperchemie and Anorganische Materialien&quot; (Solid State Chemistry and Inorganic Materials)</td>
<td>Institute of Inorganic Chemistry</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul führt in die Festkörperchemie ein. Schwerpunkte sind Struktur, chemische und physikalische Eigenschaften, Synthesemethoden sowie ausgewählte Materialien von Festkörpern.

**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 (3)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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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Homogeneous Catalysis
(25 ECTS credits)
Compulsory Courses
(20 ECTS credits)
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<tbody>
<tr>
<td>Organo- and Biocatalysis</td>
<td>08-HKM1-152-m01</td>
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<tbody>
<tr>
<td>Lecturer of the seminar &quot;Organo- and Biokatalyse&quot;</td>
<td>Faculty of Chemistry and Pharmacy</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)

| S (3) |

**Method of assessment**

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/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>Advanced organometallic chemistry and its application in homogeneous catalysis</td>
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<tbody>
<tr>
<td>lecturer of the seminar &quot;Spezielle Metallorganische Chemie und deren Anwendung in der Homogenkatalyse&quot;</td>
<td>Institute of Inorganic Chemistry</td>
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<tbody>
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</table>

Other prerequisites: --

**Contents**

German contents available but not translated yet.

Das Modul bietet die Möglichkeit, Elementorganische Verbindungen der Übergangsmetalle mit homogenkatalytischen Anwendungen im Detail zu betrachten.

**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 (3)

Module taught in: German or English

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
### Module title

Practical course "Homogeneous catalysis in Inorganic Chemistry"

### Abbreviation

08-HKM3AC-161-m01

### Module coordinator

Lecturer of the seminar "Spezielle Metallorganische Chemie and deren Anwendung in der Homogenkatalyse"

### Module offered by

Institute of Inorganic Chemistry

### ECTS

5

### Method of grading

Only after successfully completed

### Duration

1 semester

### Module level

Graduate

### Other prerequisites

--

### Contents

German contents available but not translated yet.


### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

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

P (6)

Module taught in: German or English

### Method of assessment

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

Report on practical course (approx. 10 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
## Module title

Practical course "Homogeneous catalysis in Organic Chemistry"

## Abbreviation

08-HKM3OC-161-m01

## Module coordinator

Lecturer of the seminar "Spezielle Metallorganische Chemie and deren Anwendung in der Homogenkatalyse"

## Module offered by

Institute of Organic Chemistry

## ECTS

5

## Method of grading

Only after succ. compl. of module(s)

## Duration

1 semester

## Module level

Graduate

## Other prerequisites

--

## Contents

German contents available but not translated yet.


## Intended learning outcomes

German intended learning outcomes available but not translated yet.


## Courses

P (6)

Module taught in: German or English

## Method of assessment

Report on practical course (approx. 10 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

## Allocation of places

--

## Additional information

--

## Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Compulsory Electives
(5 ECTS credits)
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<tr>
<td>Advanced transition metal chemistry</td>
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<td>lecturer of the seminar &quot;Spezielle Übergangsmetallchemie&quot;</td>
<td>Institute of Inorganic Chemistry</td>
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**Contents**

German contents available but not translated yet.

Das Modul vertieft Inhalte der Stoffchemie von Übergangsmetallen und der Koordinationschemie. Es führt in die Bioanorganische Chemie ein und zeigt aktuelle Entwicklungen in der Übergangsmetallchemie auf.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, Übergangsmetalle und Koordinationsverbindungen auf fachlich hohem Niveau zu erklären. Er/Sie kann grundlegende Inhalte der Bioorganischen Chemie darstellen.

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

S (3)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Module title
Statistical Mechanics and Reaction Dynamics

Abbreviation
08-PCM2-161-m01

Module coordinator
Lecturer of seminar "Chemische Dynamik" (Chemical Dynamics)

Module offered by
Institute of Physical and Theoretical Chemistry

ECTS
5

Method of grading
Numerical grade

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

Duration
1 semester

Module level
Graduate

Other prerequisites
-

Contents
The module deals with selected contents of statistical mechanics and reaction dynamics. It introduces the basic principles of statistical thermodynamics and conveys the transition state theory. Other topics are unimolecular and bimolecular reactions as well as charge and energy transfer.

Intended learning outcomes
The students are familiar with selected contents of statistical mechanics and reaction dynamics. They know the basic principles of statistical thermodynamics and can apply them.

Courses
1. S (2) + Ü (1)
Module taught in: German or English

Method of assessment
1. Written examination (approx. 90 minutes) or
2. Oral examination of one candidate each (approx. 20 minutes)
or
3. Talk (approx. 30 minutes)
Language of assessment: German and/or English

Allocation of places
-

Additional information
-

Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
<thead>
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<td>Modern Synthetic Methods</td>
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<tr>
<td>lecturer of the seminar</td>
<td>Institute of Organic Chemistry</td>
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<tbody>
<tr>
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<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul behandelt moderne stereoselektive Synthesemethoden. Schwerpunkt sind ausgewählte Totalsynthesen, Organometallchemie und Katalyse.

**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 (2) + Ü (1)  
Module taught in: German or English

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)  
Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
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<tr>
<td>Basics and applications of quantum chemistry</td>
<td>08-TCM2-161-m01</td>
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</table>

**Contents**
The module introduces students to computational chemistry.

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

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

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

S (2) + Ü (2)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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>

**Contents**

Basic methods of polymerisation: free radical polymerisations, polyadditions, ionic polymerisations, controlled radical polymerisations; characterisation of polymers and polymer analytics: gel permeation chromatography, endgroup analysis, mass spectrometry, rheology.

**Intended learning outcomes**

The students acquire fundamentals of polymer chemistry and the related methods for their characterisation.

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

V (2) + P (2)

**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) assessment and b) Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations)

Assessment offered: Once a year, winter semester

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

--

**Additional information**

--

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

--
Medicinal Chemistry

(25 ECTS credits)
Compulsory Courses

(15 ECTS credits)
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<tr>
<td>1 semester</td>
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</table>

**Contents**

German contents available but not translated yet.

Ausgewählte Methoden und Themen der Medizinischen Chemie (Synthese, Testung, Analytik, Theorie, Pharmakokinetik).

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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

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

P (10)

Module taught in: German or English

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations) as well as report (30 to 50 pages)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Module title | Abbreviation
--- | ---
Drug design | 08-MCM3-152-m01

| Module coordinator | Module offered by |
--- | ---
Lecturers Pharmazeutische Chemie (Pharmaceutical Chemistry) | Institute of Pharmacy and Food Chemistry

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

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

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

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

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

S (2) + Ü (1)

Module taught in: German or English

**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 with discussion (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

20 places. 4 places for students of the Master's degree programme Chemie (Chemistry): Places will be allocated according to the same number of subject semesters; students who have chosen Medizinische Chemie (Medical Chemistry) as their focus will be given preferential consideration; among applicants with the same number of subject semesters, places will be allocated by lot; 6 places for students of the Master's degree programme Biochemie (Biochemistry): Places will be allocated according to the number of subject semesters; among applicants with the same number of subject semesters, places will be allocated by lot; a waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

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

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Compulsory Courses

(10 ECTS credits)
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<tbody>
<tr>
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### Contents

German contents available but not translated yet.

Chemie der Arzneistoffe, gegliedert nach Indikationsgebieten; Prinzipien der Arzneistoffentwicklung, Strategien der Wirkstofffindung; Struktur-Wirkungs-Beziehungen; Molekulare Wirkmechanismen; pharmakologische Grundlagen der behandelten Arzneistoffe; Analytik der Arzneistoffe; Synthese der Arzneistoffe; Biotransformation, Pharmakokinetik einzelner Arzneistoffe; Geschichte der Arzneistoffentwicklung an Beispielen.

### Intended learning outcomes

The students acquire knowledge of pharmaceutic/medical chemistry and the according methods of their characterization.

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

<table>
<thead>
<tr>
<th>Type</th>
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### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

--

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

--
Module title
Pharmaceutical/Medicinal Chemistry 2

Abbreviation
08-MCM2b-161-m01

Module coordinator
Lecturers Pharmazeutische Chemie (Pharmaceutical Chemistry)

Module offered by
Institute of Pharmacy and Food Chemistry

ECTS
5

Method of grading
numerical grade

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

Duration
1 semester

Module level
graduate

Other prerequisites
--

Contents
German contents available but not translated yet.

Chemie der Arzneistoffe, gegliedert nach Indikationsgebieten; Prinzipien der Arzneistoffentwicklung, Strategien der Wirkstofffindung; Struktur-Wirkungs-Beziehungen; Molekulare Wirkmechanismen; pharmakologische Grundlagen der behandelten Arzneistoffe; Analytik der Arzneistoffe; Synthese der Arzneistoffe; Biotransformation, Pharmakokinetik einzelner Arzneistoffe; Geschichte der Arzneistoffentwicklung an Beispielen.

Intended learning outcomes
The students acquire knowledge of pharmaceutic/medical chemistry and the according methods of their characterization.

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

V (3)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

Allocation of places
--

Additional information
--

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

--
Module title
Mass-Spectrometry and Proteomics

Abbreviation
08-MBC-MSP-161-m01

Module coordinator
holder of the Chair of Biochemistry

Module offered by
Chair of Biochemistry

ECTS
5

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

--

Duration
1 semester

Module level
graduate

Other prerequisites
--

Contents
The module "Mass Spectrometry and Proteomics" includes a lecture, which teaches the basics of mass spectrometry of biomolecules. There, inter alia, the gentle ionization ESI and MALDI, and the functional principles of different mass analyzers such as TOF and Orbitrap are discussed. The lecture part gives an introduction to the mass spectrometric fragmentation techniques CID and ETD, to separation techniques for peptides and proteins, as well as to the analysis of mass spectrometric data (protein databases, FDR, GO terms, etc.). Furthermore, an overview of the field of quantitative proteomics is given; especially different methods of quantification by stable isotopes (SILAC, N15-Labeling, iTRAQ, etc.) will be discussed. Finally, the lecture gives insights in the mass spectrometric analysis of posttranslational modifications. The seminar part of the module imparts fundamentals of mass spectrometric analysis data. To this end, the participants will be introduced to different software packages and then work independently on exemplary data sets to find solutions for different tasks. In the practical part of the module, participants will isolate a protein complex from yeast by affinity purification. This complex is separated by 1D-SDS-PAGE and proteolytically cleaved in the gel. The peptides obtained are analyzed by nanoLC-MS / MS. Finally data analysis is conducted with the aim of identifying specific interaction partners and post-translational modifications.

Intended learning outcomes
On a broad basis, participants are taught the theoretical foundations of mass spectrometric analysis of proteins and proteomes. In the seminar, participants learn how to use data analysis software in the field of proteomics. In the practical part, students will learn affinity purification of a protein complex from yeast by affinity purification. This complex is separated by 1D-SDS-PAGE and proteolytically cleaved in the gel. The peptides obtained are analyzed by nanoLC-MS / MS. Finally data analysis is conducted with the aim of identifying specific interaction partners and post-translational modifications.

Courses
(type, number of weekly contact hours, language — if other than German)
V (2) + S (1) + P (2)

Module taught in: German or English

Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 45 to 90 minutes) or b) log (20 to 30 pages) or c) oral examination of one candidate each (20 to 30 minutes) or d) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate) or e) presentation (20 to 40 minutes)

Assessment offered: Once a year, winter semester
Language of assessment: German and/or English

Allocation of places
67 places.

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Supramolecular Chemistry
(25 ECTS credits)
Compulsory Courses

(10 ECTS credits)
### Module Catalogue for the Subject Chemistry

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

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<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<td>Supramolecular Chemistry (Basics)</td>
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<td>lecturer of lecture &quot;Organischen Chemie&quot;</td>
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<tbody>
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### Contents

German contents available but not translated yet.


### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

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

S (3)

### Method of assessment

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)

Language of assessment: German and/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>lecturer of lecture &quot;Supramolekularen Chemie (Organische Chemie/Physikalische Chemie)&quot;</td>
<td>Faculty of Chemistry and Pharmacy</td>
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<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul bietet den Studierenden die Möglichkeit, grundlegende Versuche zum Thema Supramolekularer Chemie praktisch durchzuführen. Es werden Wirt-Gast-Komplexe, Farbstoffaggregate und Nanopartikel synthetisiert sowie mit spezifischen Analysemethoden charakterisiert.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


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

P (6)

Module taught in: German or English

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Compulsory Electives

(15 ECTS credits)
### Module Catalogue for the Subject Chemistry

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

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<tbody>
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### Contents

German contents available but not translated yet.


### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

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

S (3)

### Method of assessment

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<table>
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<td>lecturer of lecture &quot;Supramolekularen Chemie (Organische Chemie/Physikalische Chemie)&quot;</td>
<td>Institute of Organic Chemistry</td>
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<tbody>
<tr>
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<td>graduate</td>
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</table>

**Contents**

The module deepens special synthetic and analytical methods of Supramolecular Chemistry. The students work independently in the laboratory, record their research results and present them in a talk.

**Intended learning outcomes**

The students are able to carry out demanding synthetic and analytical methods in the field of Supramolecular Chemistry experimentally and to evaluate the results. He/She can present their research results in a talk.

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

P (6)
Module taught in: German or English

**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. 20 minutes)
Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

--

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

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## Module title

**Physical chemistry of supramolecular assemblies**

| Abbreviation | 08-PCM5-161-m01 |

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### Module coordinator

Lecturer of the seminar "Physikalische Chemie Supramolekularer Strukturen"

### Module offered by

Institute of Physical and Theoretical Chemistry

### ECTS

<table>
<thead>
<tr>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
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### Duration

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

### Contents

German contents available but not translated yet.


### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

S (2) + Ü (1)

Module taught in: German or English

### Method of assessment

A) written examination (approx. 90 minutes) or B) oral examination of one candidate each (approx. 20 minutes) or C) talk (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
### Module title
Bioinorganic Chemistry

### Abbreviation
08-ACM2-161-m01

### Module coordinator
Lecturer of seminar "Anorganische Aspekte der Biochemie and Medizinischen Chemie" (Inorganic Aspects of Biochemistry and Medicinal Chemistry)

### Module offered by
Institute of Inorganic Chemistry

### ECTS
5

### Method of grading
Numerical grade

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

### Duration
1 semester

### Module level
Graduate

### Other prerequisites
--

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

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

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


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

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of Weekly Contact Hours</th>
<th>Language</th>
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<tbody>
<tr>
<td>S</td>
<td>(3)</td>
<td>German or English</td>
</tr>
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</table>

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

- a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

### Referred to in LPO I (examination regulations for teaching-degree programmes)
--
## Module title
Basics and applications of quantum chemistry

## Abbreviation
08-TCM2-161-m01

## Module coordinator
Lecturer of lecture "Computational Chemistry"

## Module offered by
Institute of Physical and Theoretical Chemistry

## ECTS
5

## Method of grading
Numerical grade

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

## Duration
1 semester

## Module level
Graduate

## Other prerequisites
--

## Contents
The module introduces students to computational chemistry.

## Intended learning outcomes
Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

## Courses
S (2) + Ü (2)

## Method of assessment
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

## Allocation of places
--

## 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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</thead>
<tbody>
<tr>
<td>Organic Functional Materials</td>
<td>08-OCM-FM-161-m01</td>
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</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecturer of the seminar &quot;Organische Funktionsmaterialien&quot;</td>
<td>Institute of Organic Chemistry</td>
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</table>

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</tbody>
</table>

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezifische Themen der organischen Funktionsmaterialien. Schwerpunkte sind grundlegende physikalische Effekte, organische Festkörper, Anwendung organischer Funktionsmaterialien und organische und metallorganische Polymerchemie.

**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 (3)  

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**  

--

**Additional information**

--

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

--
### Module title
Nanoscale Materials

### Abbreviation
08-PCM3-161-m01

### Module coordinator
Lecturer of the seminar "Nanoskalige Materialien"

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

### ECTS
5

### Method of grading
Numerical grade

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

### Duration
1 semester

### Module level
Graduate

### Other prerequisites
--

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


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

Die Studierenden sind in der Lage, nanoskalige Materialien zu charakterisieren. Er/Sie kann Analysenmethoden sowie Anwendungsgebiete nanoskaliger Materialien anführen.

### Courses
S (2) + Ü (1)

Module taught in: German or English

### Method of assessment
**a)** written examination (approx. 90 minutes) or **b)** oral examination of one candidate each (approx. 20 minutes) or **c)** talk (approx. 30 minutes)

Language of assessment: German and/or English

Creditable for bonus

### Allocation of places
--

### Additional information
--

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

--
Theoretical Chemistry
(25 ECTS credits)
Compulsory Courses

(15 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Basics and applications of quantum chemistry</td>
<td>08-TCM2-161-m01</td>
</tr>
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</table>

**Module coordinator**

lecturer of lecture "Computational Chemistry"

**Module offered by**

Institute of Physical and Theoretical Chemistry

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</tbody>
</table>

**Duration**

1 semester

**Module level**

graduate

**Other prerequisites**

--

### Contents

The module introduces students to computational chemistry.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

### Courses

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

S (2) + Ü (2)

### Method of assessment

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

- a) written examination (approx. 90 to 180 minutes) or
- b) oral examination of one candidate each (20 to 30 minutes) or
- c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or
- d) log (approx. 20 pages) or
- e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
### Module Catalogue for the Subject Chemistry

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

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerical Methods and Programming</td>
<td>08-TCM3-161-m01</td>
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</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecturer of lecture &quot;Programmieren in Theoretischer Chemie&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<table>
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<tr>
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<tr>
<th>Duration</th>
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<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

### Contents

German contents available but not translated yet.

Das Modul führt in Grundlagen der Programmierung in der Theoretischen Chemie ein und zeigt Anwendungsgebiete auf.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden können eine in der Theoretischen Chemie verwendete Programmiersprache theoretisch erklären und praktisch anwenden sowie Anwendungsmöglichkeiten anführen.

### Courses

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

<table>
<thead>
<tr>
<th>S</th>
<th>(2) + Ü (2)</th>
</tr>
</thead>
</table>

### Method of assessment

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

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

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Quantum Dynamics</td>
<td>08-TCM4-161-m01</td>
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</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecturer of lecture &quot;Quantendynamik&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<table>
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<tbody>
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<td>graduate</td>
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</tbody>
</table>

**Contents**

Time-dependent Schrödinger equation, propagators, time-dependent perturbation theory, adiabatic theorem, diabatic and adiabatic states, non-adiabatic dynamics, mixed quantum-classical dynamics.

**Intended learning outcomes**

The students possess knowledge about the time-dependent description of the nuclear and electronic dynamics in molecules. Their insight into the methods and the numerical realizations allow them to carry out applications in the field of theoretical chemistry.

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

S (2) + Ü (2)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Compulsory Electives

(10 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Selected topics in theoretical chemistry</td>
<td>08-TCM1-161-m01</td>
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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;Theoretische Chemie&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</tr>
</tbody>
</table>

**Contents**

The module introduces students to theoretical chemistry.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden können mathematische und physikalische Grundlagen quantenchemischer und quantendynamischer Ansätze der Theoretischen Chemie darstellen.

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

| S (2) + Ü (2) |

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
### Module title
Theoretical Chemistry - Project course quantum chemistry

### Abbreviation
08-TCAP1-161-m01

### Module coordinator
head of the research group offering the module

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

<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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<tbody>
<tr>
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</tbody>
</table>

### Duration
graduate

### Other prerequisites
--

### Contents
The module offers students the opportunity to work in a group of the Institute for Theoretical Chemistry as well as to become familiar with typical working methods. The main focus of the practical course is Quantum Chemistry.

### Intended learning outcomes
The students are able to apply typical working methods of the Theoretical Chemistry, especially in the area of Quantum Chemistry. He/She can explain specific contents of Quantum Chemistry.

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

| P (5) |

### 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 and/or English

### Allocation of places
--

### Additional information
--

### Referred to in LPO I (examination regulations for teaching-degree programmes)
--
**Module title**  
Theoretical Chemistry - Project course quantum dynamics

**Abbreviation**  
08-TCAP2-161-m01

**Module coordinator**  
head of the research group offering the module

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

<table>
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<th>ECTS</th>
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</table>

**Duration**  
Module level: graduate  
Other prerequisites: --

**Contents**
The module offers students the opportunity to work in a group of the Institute for Theoretical Chemistry as well as to become familiar with typical working methods. The main focus of the practical course is Quantum Dynamics.

**Intended learning outcomes**
The students are able to apply typical working methods of the Theoretical Chemistry, especially in the area of Quantum Dynamics. He/She can explain specific contents of Quantum Dynamics.

**Courses** (type, number of weekly contact hours, language — if other than German)
P (5)

**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 and/or English

**Allocation of places**  
--

**Additional information**  
--

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

--
Module Catalogue for the Subject Chemistry
Master’s with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Drug design</td>
<td>08-MCM3-152-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
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</thead>
<tbody>
<tr>
<td>Pharmazeutische Chemie (Pharmaceutical Chemistry)</td>
<td>Institute of Pharmacy and Food Chemistry</td>
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<table>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

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

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

S (2) + Ü (1)

Module taught in: German or English

**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 with discussion (approx. 30 minutes)
Language of assessment: German and/or English

**Allocation of places**

20 places. 4 places for students of the Master’s degree programme Chemie (Chemistry): Places will be allocated according to the same number of subject semesters; students who have chosen Medizinische Chemie (Medicinal Chemistry) as their focus will be given preferential consideration; among applicants with the same number of subject semesters, places will be allocated by lot.; 6 places for students of the Master’s degree programme Biochemie (Biochemistry): Places will be allocated according to the number of subject semesters; among applicants with the same number of subject semesters, places will be allocated by lot; a waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

--

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

--
Additional qualifications
(15 ECTS credits)
Subfield Additional qualifications Compulsory Electives Focuses

(5 ECTS credits)

In the sub-area "Zusätzliche Kompetenzen aus den Schwerpunkten" ("Additional Skills from the Focus Area"), students may use a module of their choice from the Focus area that they are not using in the area of mandatory electives 1.
Module title
Molecular Biology laboratory course

Abbreviation
08-BC-MOLP-152-m01

Module coordinator
holder of the Chair of Biochemistry

Module offered by
Faculty of Chemistry and Pharmacy

ECTS
10

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

Duration
1 semester

Module level
undergraduate

Other prerequisites
--

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

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

Courses (type, number of weekly contact hours, language — if other than German)
P (5)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 45 to 90 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (20 to 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 to 20 minutes per candidate) or e) presentation (20 to 30 minutes) or f) practical examination (on average approx. 2 hours; time to complete will vary according to subject area but will not exceed a maximum of 4 hours)

Assessment offered: Once a year, winter semester
Language of assessment: German and/or English

Allocation of places
Biochemie (Biochemistry), Bachelor's: 24 places. Selection process Biochemie (Biochemistry), Bachelor's (180 ECTS credits): Should the number of applications exceed the number of available places, places will be allocated according to the following quotas: Quota 1 (two thirds of places): current average grade of successfully completed modules; among applicants with the same average grade, places will be allocated by lot. Quota 2 (one third of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

Chemie (Chemistry), Master's: 6 places. Selection process Chemie (Chemistry), Bachelor's (120 ECTS credits): Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.

Additional information
--

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

Abbreviation
08-HKM1-152-m01

Module coordinator
Lecturer of the seminar "Organo- and Biokatalyse"

Module offered by
Faculty of Chemistry and Pharmacy

ECTS
5

Method of grading
Numerical grade

Only after succ. compl. of module(s)

Duration
1 semester

Module level
Graduate

Other prerequisites
--

Contents


Intended learning outcomes


Courses (type, number of weekly contact hours, language — if other than German)
S (3)

Method of assessment (type, scope, language — if other than German, examination offered — If not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

Allocation of places
--

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Module title | Abbreviation
---|---
Drug design | 08-MCM3-152-m01

Module coordinator | Module offered by
Pharmazeutische Chemie (Pharmaceutical Chemistry) | Institute of Pharmacy and Food Chemistry

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

Contents

German contents available but not translated yet.


Intended learning outcomes

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

Courses

<table>
<thead>
<tr>
<th>type, number of weekly contact hours, language — if other than German</th>
</tr>
</thead>
<tbody>
<tr>
<td>S (2) + Ü (1)</td>
</tr>
</tbody>
</table>

Module taught in: German or English

Method of assessment

<table>
<thead>
<tr>
<th>type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus</th>
</tr>
</thead>
<tbody>
<tr>
<td>presentation with discussion (approx. 30 minutes)</td>
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</table>

Language of assessment: German and/or English

Allocation of places

20 places. 4 places for students of the Master’s degree programme Chemie (Chemistry): Places will be allocated according to the same number of subject semesters; students who have chosen Medizinische Chemie (Medical Chemistry) as their focus will be given preferential consideration; among applicants with the same number of subject semesters, places will be allocated by lot.; 6 places for students of the Master’s degree programme Biochemie (Biochemistry): Places will be allocated according to the number of subject semesters; among applicants with the same number of subject semesters, places will be allocated by lot; a waiting list will be maintained and places re-allocated by lot as they become available.

Additional information

Referred to in LPO I (examination regulations for teaching-degree programmes)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical-analytical Chemistry</td>
<td>08-PH-KAC-152-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>lecturer of lecture “Klinisch-analytische Chemie” (Clinical and Analytical Chemistry)</td>
<td>Institute of Pharmacy and Food Chemistry</td>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

**Contents**

This module covers specific topics of clinical analytical chemistry.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über Fortgeschrittenkenntnisse der Molekularbiologie.

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

V (3)

**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. 120 minutes)
Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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<tr>
<td>Practical course of clinical-analytical Chemistry</td>
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**Module coordinator**

| Lecturer of lecture "Klinisch-analytische Chemie" (Clinical and Analytical Chemistry) |

**Module offered by**

| Institute of Pharmacy and Food Chemistry |

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</table>

**Contents**

German contents available but not translated yet.

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

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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

**Courses**

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

| P (5) |

**Method of assessment**

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
### Module Catalogue for the Subject
Chemistry
Master's with 1 major, 120 ECTS credits

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<td>lecturer of lecture &quot;Bioorganische Chemie&quot; (Bioorganic Chemistry)</td>
<td>Institute of Organic 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

<table>
<thead>
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### Method of assessment

(a) written examination (approx. 45 to 90 minutes) or (b) oral examination of one candidate each (20 to 30 minutes) or (c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/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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<th>Method of grading</th>
<th>Module level</th>
<th>Other prerequisites</th>
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<tr>
<td>Supramolecular Chemistry (Basics)</td>
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**Module coordinator**

Lecturer of lecture "Organischen Chemie"

**Module offered by**

Faculty of Chemistry and Pharmacy

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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

S (3)

**Method of assessment**

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Module title: Molecular Materials (Lecture)  
Abbreviation: 08-FU-MoMaV-152-m01

Module coordinator: degree programme coordinator Funktionswerkstoffe (Functional Materials)  
Module offered by: Chair of Chemical Technology of Material Synthesis

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

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

Contents: Chemical bonds and molecular interactions, supramolecular chemistry, molecular materials, colloids, nano particles, thin films.

Intended learning outcomes: The students gain fundamental knowledge in the relationships of physical, chemical and technological properties of materials and their structure. They understand the significance of various inter- and intramolecular interactions and how they determine the properties of molecular materials. They learn how to familiarize themselves with a scientific topic including a literature search, and how to give a presentation including discussion and feedback.

Courses: (type, number of weekly contact hours, language — if other than German)  
V (3) + S (1)

Method of assessment: (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)  
[a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)] as well as talk (approx. 30 minutes), weighted 3:1

Language of assessment: German and/or English

Allocation of places: --

Additional information: --

Referred to in LPO I (examination regulations for teaching-degree programmes): --
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Chemically and bio-inspired Nanotechnology for Material Synthesis</td>
<td>08-FU-NT-152-m01</td>
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<tr>
<td>degree programme coordinator Funktionswerkstoffe (Functional Materials)</td>
<td>Chair of Chemical Technology of Material Synthesis</td>
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</table>

**Contents**

Synthesis methods and parameters in sol-gel chemistry as well as characterisation and application of created materials. Basic principles of bio-mineralisation, structure of biomaterials and introduction to bio-inspired materials synthesis.

**Intended learning outcomes**

The student possesses profound knowledge about sol-gel chemistry and biomineralisation.

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

V (4)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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><strong>Module title</strong></th>
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<tr>
<td>Material Science 1 (Basic introduction)</td>
<td>08-FU-MaWi1-152-m01</td>
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<table>
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<tr>
<th><strong>Module coordinator</strong></th>
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<tr>
<td>holder of the Chair of Chemical Technology of Material Synthesis</td>
<td>Chair of Chemical Technology of Material Synthesis</td>
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</table>

**Contents**


**Intended learning outcomes**

The students possess comprehensive knowledge about various techniques form different areas of the field of chemical process engineering. For a given objective they are able to weigh the pros and cons of different techniques and can suggest ways of fabrication, processing and treatment of materials. Furthermore they are confident in handling of measurement data as well as statistical and systematic errors and possess extensive knowledge about nomenclature, significance as well as practically determining characteristic material properties.

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

V (3) + Ü (1)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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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<td>Material Science 2 (The Material Groups)</td>
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<tr>
<td>holder of the Chair of Chemical Technology of Material Synthesis</td>
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</table>

### Contents


### Intended learning outcomes

The students acquire fundamental knowledge about fabrication and properties of the major classes of materials and are able to apply this to scientific problems.

### Courses

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

V (3) + Ü (1)

### Method of assessment

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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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<td>holder of the Chair of Functional Materials in Medicine and Dentistry</td>
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</table>

### Contents

Basic methods of polymerisation: free radical polymerisations, polyadditions, ionic polymerisations, controlled radical polymerisations; characterisation of polymers and polymer analytics: gel permeation chromatography, endgroup analysis, mass spectrometry, rheology.

### Intended learning outcomes

The students acquire fundamentals of polymer chemistry and the related methods for their characterisation.

### Courses

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

| V (2) + P (2) |

### 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) assessment and b) Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations)

Assessment offered: Once a year, winter semester

Language of assessment: German and/or English creditable for bonus

### Allocation of places

--

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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### Module Catalogue for the Subject Chemistry

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

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<td>Laser Spectroscopy</td>
<td>08-PCM1a-161-m01</td>
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<td>lecturer of seminar &quot;Laserspektroskopie&quot; (Laser Spectroscopy)</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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</table>

#### Contents

German contents available but not translated yet.

Das Modul führt in die Grundlagen der Laserspektroskopie ein. Als experimentelle Methoden werden die Absorptions- und Emissionsspektroskopie behandelt.

#### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, Aufbau und Funktionsweise eines Lasers sowie die optischen Grundlagen zu erklären. Er/Sie kann das Prinzip der Absorptions- und Emissionsspektroskopie darstellen.

#### Courses

<table>
<thead>
<tr>
<th>(type, number of weekly contact hours, language — if other than German)</th>
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Module taught in: German or English

#### Method of assessment

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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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<td>lecturer of seminar &quot;Laserspektroskopie&quot; (Laser Spectroscopy)</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<tr>
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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 können moderne experimentelle Methoden der Physikalischen Chemie sicher praktisch durchführen. Er/Sie kann erhaltene Messwerte inhaltlich und graphisch mit geeigneten Computerprogrammen sowie rechnerisch analysieren und in einem wissenschaftlichen Protokoll formulieren.

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

P (4)
Module taught in: German or English

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)
Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
**Module title**  | Statistical Mechanics and Reaction Dynamics  
**Abbreviation**  | 08-PCM2-161-m01  
**Module coordinator**  | Lecturer of seminar "Chemische Dynamik" (Chemical Dynamics)  
**Module offered by**  | Institute of Physical and Theoretical Chemistry  
**ECTS**  | 5  
**Method of grading**  | Only after succ. compl. of module(s)  
**Numerical grade**  | --  
**Duration**  | 1 semester  
**Module level**  | Graduate  
**Other prerequisites**  | --  

**Contents**

The module deals with selected contents of statistical mechanics and reaction dynamics. It introduces the basic principles of statistical thermodynamics and conveys the transition state theory. Other topics are unimolecular and bimolecular reactions as well as charge and energy transfer.

**Intended learning outcomes**

The students are familiar with selected contents of statistical mechanics and reaction dynamics. They know the basic principles of statistical thermodynamics and can apply them.

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

S (2) + Ü (1)  
Module taught in: German or English

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)

Language of assessment: German and/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>Nanoscale Materials</td>
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<tr>
<td>lecturer of the seminar &quot;Nanoskalige Materialien&quot;</td>
<td>Institute of Physical and Theoretical 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.

Die Studierenden sind in der Lage, nanoskalige Materialien zu charakterisieren. Er/Sie kann Analysenmethoden sowie Anwendungsgebiete nanoskaliger Materialien anführen.

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

S (2) + Ü (1)

Module taught in: German or English

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)

Language of assessment: German and/or English

creditable for bonus

**Allocation of places**

--

**Additional information**

--

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

--
## Module title
Ultrafast spectroscopy and quantum-control

### Abbreviation
08-PCM4-161-m01

### Module coordinator
Lecturer of the seminar "Nanoskalige Materialien"

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

### ECTS
5

### Method of grading
**Numerical grade**

### Duration
1 semester

### Module level
Graduate

### Other prerequisites
Prior completion of modules 08-PCM1a and 08-PCM1b recommended.

## Contents
German contents available but not translated yet.

Das Modul behandelt spezielle Themen der Ultrakurzzeitspektroskopie und Quantenkontrolle. Schwerpunkte sind ultrakurze Laserimpulse, zeitaufgelöste Laserspektroskopie sowie kohärente Kontrolle.

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


## Courses
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<tr>
<td>S</td>
<td>2 + Ü (1)</td>
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Module taught in: German or English

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

- a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)
- c) talk (approx. 30 minutes)

Language of assessment: German and/or English

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

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


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

S (2) + Ü (1)

Module taught in: German or English

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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**Contents**

German contents available but not translated yet.

Das Modul bietet den Studierenden die Möglichkeit, in einem Arbeitskreis des Instituts für Physikalische Chemie mit zu arbeiten sowie spezifische Synthese- und Analysemethoden kennen zu lernen.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden können für einen Arbeitskreis der Physikalischen Chemie typische Untersuchungsmethoden anwenden sowie die erhaltenen Ergebnisse analysieren um aktuelle Fragestellungen der Physikalischen Chemie zu beantworten.

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

P (4)
Module taught in: German or English

**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. 20 minutes)
Language of assessment: German and/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>Basics and applications of quantum chemistry</td>
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**Module coordinator**

lecturer of lecture "Computational Chemistry"

**Module offered by**

Institute of Physical and Theoretical Chemistry

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</table>

**Duration**

1 semester

**Module level**

graduate

**Other prerequisites**

--

**Contents**

The module introduces students to computational chemistry.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

**Courses**

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

S (2) + Ü (2)

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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>

**Contents**

German contents available but not translated yet.

Das Modul führt in Grundlagen der Programmierung in der Theoretischen Chemie ein und zeigt Anwendungsgebiete auf.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden können eine in der Theoretischen Chemie verwendete Programmiersprache theoretisch erklären und praktisch anwenden sowie Anwendungsmöglichkeiten anführen.

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

S (2) + Ü (2)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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>

**Contents**

Time-dependent Schrödinger equation, propagators, time-dependent perturbation theory, adiabatic theorem, diabatic and adiabatic states, non-adiabatic dynamics, mixed quantum-classical dynamics.

**Intended learning outcomes**

The students possess knowledge about the time-dependent description of the nuclear and electronic dynamics in molecules. Their insight into the methods and the numerical realizations allow them to carry out applications in the field of theoretical chemistry.

**Courses**

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

S (2) + Ü (2)

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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**Contents**

The module introduces students to theoretical chemistry.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden können mathematische und physikalische Grundlagen quantenchemischer und quantendynamischer Ansätze der Theoretischen Chemie darstellen.

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

S (2) + Ü (2)

**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. 90 to 180 minutes) or
- oral examination of one candidate each (20 to 30 minutes) or
- oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or
- log (approx. 20 pages) or
- presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Module title
Theoretical Chemistry - Project course quantum chemistry

Abbreviation
08-TCAP1-161-m01

Module coordinator
head of the research group offering the module

Module offered by
Institute of Physical and Theoretical Chemistry

ECTS
5

Method of grading
(only) successfully completed

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

Duration
Module level
graduate

Other prerequisites
--

Contents
The module offers students the opportunity to work in a group of the Institute for Theoretical Chemistry as well as to become familiar with typical working methods. The main focus of the practical course is Quantum Chemistry.

Intended learning outcomes
The students are able to apply typical working methods of the Theoretical Chemistry, especially in the area of Quantum Chemistry. He/She can explain specific contents of Quantum Chemistry.

Courses (type, number of weekly contact hours, language — if other than German)
P (5)

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 and/or English

Allocation of places
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Additional information
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Referred to in LPO 1 (examination regulations for teaching-degree programmes)
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### Contents

The module offers students the opportunity to work in a group of the Institute for Theoretical Chemistry as well as to become familiar with typical working methods. The main focus of the practical course is Quantum Dynamics.

### Intended learning outcomes

The students are able to apply typical working methods of the Theoretical Chemistry, especially in the area of Quantum Dynamics. He/She can explain specific contents of Quantum Dynamics.

### Courses

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### Method of assessment

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

- presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

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

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### Contents

German contents available but not translated yet.

Das Modul behandelt spezifische Themen der Hauptgruppen- und Übergangsmetallchemie. Schwerpunkte sind spezielle Verbindungen der Hauptgruppenelemente (HGE), Bindungssituation in HGE und HGE-Verbindungen, Stoffchemie der Übergangsmetalle und Koordinationschemie.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, spezielle Verbindungen der Hauptgruppenelemente zu charakterisieren und erklären. Er/Sie kann stoffchemische Eigenschaften von Übergangsmetallen beschreiben und Struktur sowie chemische und physikalische Aspekte von Koordinationsverbindungen analysieren.

### Courses

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

S (3) + S (3)

### Method of assessment

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title
Inorganic Chemistry practical course for advanced
Abbreviation
08-ACPM-161-m01

Module coordinator
focus point coordinator "Inorganic Chemistry"
Module offered by
Institute of Inorganic Chemistry

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

Duration
Module level
Other prerequisites
graduate

Contents
German contents available but not translated yet.

Das Modul vertieft spezielle Synthese- und Analysemethoden der anorganischen Chemie. Im Schwerpunkt steht das Arbeiten unter Inertgas, Reinigungsmethoden, Spektrenanalyse sowie Kristallographie. Die Studierenden arbeiten selbständig im Labor, halten ihre Forschungsergebnisse in einem Praktikumsbericht fest und präsentieren diese in einem Vortrag.

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

Die Studierenden sind in der Lage, anspruchsvolle anorganische Synthese- und Analysemethoden experimentell durchzuführen sowie die erhaltenen Ergebnisse auszuwerten. Er/Sie kann Forschungsergebnisse in einem wissenschaftlichen Bericht formulieren und in einem Vortrag präsentieren.

Courses
P (24)
Module taught in: German or English

Method of assessment
report on practical course (approx. 20 pages) and talk (approx. 15 minutes)
Language of assessment: German and/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>lecturer of seminar &quot;Anorganische Aspekte der Biochemie and Medizinischen Chemie&quot; (Inorganic Aspects of Biochemistry and Medicinal Chemistry)</td>
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**Contents**

German contents available but not translated yet.

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

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


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

S (3)

Module taught in: German or English

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

--

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

--
**Module title**  
Solid state chemistry and inorganic materials

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>08-ACM3-161-m01</th>
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</thead>
</table>

**Module coordinator**  
Lecturer of seminar "Festkörperchemie and Anorganische Materialien" (Solid State Chemistry and Inorganic Materials)

**Module offered by**  
Institute of Inorganic Chemistry

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<tbody>
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<td>1 semester</td>
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**Contents**

German contents available but not translated yet.

Das Modul führt in die Festkörperchemie ein. Schwerpunkte sind Struktur, chemische und physikalische Eigenschaften, Synthesemethoden sowie ausgewählte Materialien von Festkörpern.

**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 (3)

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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>Modern Synthetic Methods</td>
<td>08-OCM-SYNT-161-m01</td>
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<tr>
<td>lecturer of the seminar</td>
<td>Institute of Organic Chemistry</td>
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<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul behandelt moderne stereoselektive Synthesemethoden. Schwerpunkt sind ausgewählte Totalsynthesen, Organometallchemie und Katalyse.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, anspruchsvolle chemische Synthesen stereoselektiv zu planen sowie stereoisch zu analysieren. Er/Sie kann Totalsynthesen erklären. Er/Sie kann Aspekte der Organometallchemie und Katalyse in der Syntheschemie darstellen.

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

S (2) + Ü (1)
Module taught in: German or English

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)
Language of assessment: German and/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>Advanced Research Project Organic Chemistry</td>
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**Module coordinator**
head of the research group offering the module

**Module offered by**
Institute of Organic Chemistry

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**Duration**
1 semester

**Module level**
graduate

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

Das Modul bietet den Studierenden die Möglichkeit, in einem Arbeitskreis des Instituts für Organische Chemie mit zu arbeiten sowie spezifische Synthese- und Analysemethoden kennen zu lernen.

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

Die Studierenden sind in der Lage, arbeitskreistypische synthetische, analytische und theoretische forschungsrelevante Inhalte zu beschreiben sowie anzuwenden.

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

P (20)
Module taught in: German or English

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

Log (approx. 15 to 20 pages) and talk (approx. 15 minutes)
Language of assessment: German and/or English

**Allocation of places**
--

**Additional information**
--

**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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<tr>
<td>Modern Aspects of Natural Product Chemistry and Biological Chemistry</td>
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**Module coordinator**

Lecturer of the seminar

**Module offered by**

Institute of Organic Chemistry

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</table>

**Duration**

1 semester

**Module level**

Graduate

**Other prerequisites**

--

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezielle Themen der Naturstoffchemie und Biologischer Chemie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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

**Courses**

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

S (3)

Module taught in: German or English

**Method of assessment**

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

MA Chemie: unbegrenzt, Ma Biochemie: 20 places. Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Module title

Organic Functional Materials

Abbreviation

08-OCM-FM-161-m01

Module coordinator

Lecturer of the seminar "Organische Funktionsmaterialien"

Module offered by

Institute of Organic Chemistry

ECTS

5

Method of grading

Only after succ. compl. of module(s)

Duration

1 semester

Module level

Graduate

Other prerequisites

--

Contents

German contents available but not translated yet.

Das Modul behandelt spezifische Themen der organischen Funktionsmaterialien. Schwerpunkte sind grundlegende physikalische Effekte, organische Festkörper, Anwendung organischer Funktionsmaterialien und organische und metallorganische Polymerchemie.

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 (3)

Method of assessment

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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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<tbody>
<tr>
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<td>graduate</td>
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</table>

**Contents**

The module covers specific topics of molecular physiology and functional biochemistry in lectures and exercises.

**Intended learning outcomes**

After attending the module events, students have solid knowledge in molecular biology.

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

V (2) + Ü (1)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
### Module title

**Practical course "Molecular Machines" for advanced students**

| Abbreviation | 08-BC-VPMM-161-m01 |

### Module coordinator

holder of the Chair of Biochemistry

### Module offered by

Chair of Biochemistry

### ECTS

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### Duration

graduate

### Other prerequisites

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### Contents

German contents available but not translated yet.

Das Modul ermöglicht ein vertieftes Einarbeiten in ein Forschungsthema. Ausgewählte Methoden und Themen der Molekularbiologie und Biochemie; Klonierung, Mutagenese, Proteinexpression und -aufreinigung, RNA-Protein- und Protein-Protein Interaktionsstudien, Isolierung und funktionelle Analyse von makromolekularen Komplexen.

### Intended learning outcomes

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

### Courses

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

P (10)

### Method of assessment

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

Log (approx. 20 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
### Module title

**Practical course “Protein Degradation in Eukaryotes” for advanced students**

**Abbreviation**  
08-BC-VPPD-161-m01

### Module coordinator

holder of the Chair of Biochemistry

### Module offered by

Chair of Biochemistry

### ECTS

10

### Method of grading

Only after succ. compl. of module(s)

### Duration

graduate

### Other prerequisites

--

### Contents

German contents available but not translated yet.

Das Modul ermöglicht ein vertieftes Einarbeiten in ein Forschungsthema auf dem Gebiet der Protein degradation in Eukaryoten.

### Intended learning outcomes

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

### Courses

**P (10)**

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

Log (approx. 20 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

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### Referred to in LPO I

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<td>Practical course &quot;RNA Biochemistry&quot; for advanced students</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 beherrscht es, sich in ein Forschungsthema vertieft einzuarbeiten sowie die Ergebnisse im Rahmen eines Vortrags darzustellen. Der/Die Studierende ist in der Lage, mittels unterschiedlicher Methoden, verschiedene Mechanismen der allgemeinen und spezifischen Translationskontrolle entsprechend selbständig zu erarbeiten, die Ergebnisse fachgerecht aufzubereiten und verständlich zu präsentieren.

**Courses**

<table>
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**Method of assessment**

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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: Practical course "Structural Biology" for advanced students
Abbreviation: 08-BC-VPSB-161-m01

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

ECTS: 10
Method of grading: numerical grade
Only after succ. compl. of module(s): 08-BC-MOLP

Duration: graduate
Other prerequisites: --

Contents:
German contents available but not translated yet.

Das Modul beschäftigt sich mit der Frage nach Klonierung und Expression von Proteinkonstrukten für die Kristallisation. Es vermittelt die Grundlagen und Techniken der Kristallisation und Kristalloptimierung sowie der Kristallografischen Datensammlung.

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

Der/Die Studierende erwirbt ein Grundverständnis für die Herangehensweise bei der Wahl von Proteinkonstrukten für die Kristallisation. Er/Sie beherrscht nach Besuch der Modulveranstaltungen die grundlegenden Fertigkeiten und Techniken der Proteinkristallisation und Datensammlung/-verarbeitung.

Courses (type, number of weekly contact hours, language — if other than German):
P (10)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus):
Log (approx. 20 pages) and talk (approx. 15 minutes)
Language of assessment: German and/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>Lecturers specialisation subject Funktionsmaterialien (Functional Materials)</td>
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</table>

**Contents**

German contents available but not translated yet.

Im Rahmen des Moduls werden zehn Experimente mit materialwissenschaftlichem Bezug aus einer größeren Auswahl durchgeführt.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über spezielle Kenntnisse in der Durchführung materialwissenschaftlicher Experimente.

**Courses**

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

- P (8)

**Method of assessment**

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

- Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)
- Language of assessment: German and/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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**Module coordinator**
head of the research group offering the module

**Module offered by**
Chair of Chemical Technology of Material Synthesis

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**Contents**

German contents available but not translated yet.

Im Rahmen des Moduls erfolgt eine angeleitete vertiefte Einarbeitung in ein Forschungsthema sowie die Darstellung der erhaltenen Ergebnisse.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über spezielle Kenntnisse in der Durchführung materialwissenschaftlicher Experimente.

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

P (10)

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

Log (approx. 15 pages) and talk (approx. 15 minutes)

Language of assessment: German and/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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<tbody>
<tr>
<td>holder of the Chair of Functional Materials in Medicine and Dentistry</td>
<td>Faculty of Medicine</td>
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</table>

**Contents**

Deep polymer synthesis methods, special polymers (block copolymers, co-polymerization techniques, complex polymer architectures), biodegradable polymers, polypeptoides, natural polymers. We will discuss the application of the respective polymers: e.g. as biomaterials, for electrospinning, for the production of hydrogels and their behavior on surfaces.

**Intended learning outcomes**

The student acquire advanced knowledge in polymer manufacturing, analysis and applications. This involves different synthetic routes with which the different molecules can be prepared from different starting materials. Students can estimate if and how fast a polymer degrades under given circumstances. Furthermore, they gain insight into the field of technically used polymers from nature. Each section also points to possible consequences / disadvantages that synthesis of the various polymers may have, thus drawing students' understanding to ethical concerns.

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

S (2) + Ü (1)

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
## Module title

**Advanced organometallic chemistry and its application in homogeneous catalysis**

### Abbreviation

08-HKM2-161-m01

## Module coordinator

llector of the seminar "Spezielle Metallorganische Chemie and deren Anwendung in der Homogenkatalyse"

## Module offered by

Institute of Inorganic Chemistry

## ECTS

5

## Method of grading

Numerical grade

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

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## Duration

1 semester

## Module level

Graduate

## Other prerequisites

--

## Contents

German contents available but not translated yet.

Das Modul bietet die Möglichkeit, Elementorganische Verbindungen der Übergangsmetalle mit homogenkatalytischen Anwendungen im Detail zu betrachten.

## 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 (3)

Module taught in: German or English

## Method of assessment

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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>
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<td>Practical course &quot;Homogeneous catalysis in Inorganic Chemistry&quot;</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)

P (6)

Module taught in: German or English

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

report on practical course (approx. 10 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
### Module title

**Practical course "Homogeneous catalysis in Organic Chemistry"**

### Abbreviation

08-HKM3OC-161-m01

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<tr>
<td>Lecturer of the seminar &quot;Spezielle Metallorganische Chemie and deren Anwendung in der Homogenkatalyse&quot;</td>
<td>Institute of Organic Chemistry</td>
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**Contents**

German contents available but not translated yet.


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**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


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

P (6)

Module taught in: German or English

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

Report on practical course (approx. 10 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

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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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Module title
Advanced transition metal chemistry

Abbreviation
08-HKM4-161-m01

Module coordinator
Lecturer of the seminar "Spezielle Übergangsmetallchemie"

Module offered by
Institute of Inorganic Chemistry

ECTS
5

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

Duration
1 semester

Module level
graduate

Other prerequisites
--

Contents
Das Modul vertieft Inhalte der Stoffchemie von Übergangsmetallen und der Koordinationschemie. Es führt in die Bioanorganische Chemie ein und zeigt aktuelle Entwicklungen in der Übergangsmetallchemie auf.

Intended learning outcomes
Die Studierenden sind in der Lage, Übergangsmetalle und Koordinationsverbindungen auf fachlich hohem Niveau zu erklären. Er/Sie kann grundlegende Inhalte der Bioorganischen Chemie darstellen.

Courses
S (3)

Method of assessment
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

Allocation of places
--

Additional information
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Referred to in LPO I
(examination regulations for teaching-degree programmes)
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<td>Practical course medicinal chemistry</td>
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<td>Lecturers Pharmazeutische Chemie (Pharmaceutical Chemistry)</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Ausgewählte Methoden und Themen der Medizinischen Chemie (Synthese, Testung, Analytik, Theorie, Pharmakokinetik).

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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

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

P (10)

Module taught in: German or English

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations) as well as report (30 to 50 pages)

Language of assessment: German and/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>lecturers Pharmazeutische Chemie (Pharmaceutical Chemistry)</td>
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</thead>
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<td>graduate</td>
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**Contents**

German contents available but not translated yet.

Chemie der Arzneistoffe, gegliedert nach Indikationsgebieten; Prinzipien der Arzneistoffentwicklung, Strategien der Wirkstofffindung; Struktur-Wirkungs-Beziehungen; Molekulare Wirkmechanismen; pharmakologische Grundlagen der behandelten Arzneistoffe; Analytik der Arzneistoffe; Synthese der Arzneistoffe; Biotransformation, Pharmakokinetik einzelner Arzneistoffe; Geschichte der Arzneistoffentwicklung an Beispielen.

**Intended learning outcomes**

The students acquire knowledge of pharmaceutic/medical chemistry and the according methods of their characterization.

**Courses**

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

V (3)

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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<td>Pharmaceutical/Medicinal Chemistry 2</td>
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**Module coordinator**

Lecturers: Pharmazeutische Chemie (Pharmaceutical Chemistry)

**Module offered by**

Institute of Pharmacy and Food Chemistry

**ECTS**

5

**Method of grading**

Numerical grade

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

--

**Duration**

1 semester

**Module level**

Graduate

**Other prerequisites**

--

**Contents**

German contents available but not translated yet.

Chemie der Arzneistoffe, gegliedert nach Indikationsgebieten; Prinzipien der Arzneistoffentwicklung, Strategien der Wirkstofffindung; Struktur-Wirkungs-Beziehungen; Molekulare Wirkmechanismen; pharmakologische Grundlagen der behandelten Arzneistoffe; Analytik der Arzneistoffe; Synthese der Arzneistoffe; Biotransformation, Pharmakokinetik einzelner Arzneistoffe; Geschichte der Arzneistoffentwicklung an Beispielen.

**Intended learning outcomes**

The students acquire knowledge of pharmaceutic/medical chemistry and the according methods of their characterization.

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

V (3)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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)

--
### Contents

The module "Mass Spectrometry and Proteomics" includes a lecture, which teaches the basics of mass spectrometry of biomolecules. There, inter alia, the gentle ionization ESI and MALDI, and the functional principles of different mass analyzers such as TOF and Orbitrap are discussed. The lecture part gives an introduction to the mass spectrometric fragmentation techniques CID and ETD, to separation techniques for peptides and proteins, as well as to the analysis of mass spectrometric data (protein databases, FDR, GO terms, etc.). Furthermore, an overview of the field of quantitative proteomics is given; especially different methods of quantification by stable isotopes (SILAC, N15-Labeling, iTRAQ, etc.) will be discussed. Finally, the lecture gives insights in the mass spectrometric analysis of posttranslational modifications. The seminar part of the module imparts fundamentals of mass spectrometric analysis data. To this end, the participants will be introduced to different software packages and then work independently on exemplary data sets to find solutions for different tasks. In the practical part of the module, participants will isolate a protein complex from yeast by affinity purification. This complex is separated by 1D-SDS-PAGE and proteolytically cleaved in the gel. The peptides obtained are analyzed by nanoLC-MS / MS. Finally data analysis is conducted with the aim of identifying specific interaction partners and post-translational modifications.

### Intended learning outcomes

On a broad basis, participants are taught the theoretical foundations of mass spectrometric analysis of proteins and proteomes. In the seminar, participants learn how to use data analysis software in the field of proteomics. In the practical part, students will learn affinity purification of a protein complex from yeast, and typical steps of sample preparation for mass spectrometric protein analysis, such as SDS-PAGE and in-gel digestion. Participants get an insight into the operation of a nanoHPLC-coupled mass spectrometer.

### Courses

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<td>P</td>
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Module taught in: German or English

### Method of assessment

- a) written examination (approx. 45 to 90 minutes) or
- b) log (20 to 30 pages) or
- c) oral examination of one candidate each (20 to 30 minutes) or
- d) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate) or
- e) presentation (20 to 40 minutes)

Assessment offered: Once a year, winter semester

Language of assessment: German and/or English

### Allocation of places

67 places.

### Additional information

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

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<td>Supramolecular Chemistry (Practical Course)</td>
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<td>Faculty of Chemistry and Pharmacy</td>
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<tbody>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul bietet den Studierenden die Möglichkeit, grundlegende Versuche zum Thema Supramolekularer Chemie praktisch durchzuführen. Es werden Wirt-Gast-Komplexe, Farbstoffaggregate und Nanopartikel synthetisiert sowie mit spezifischen Analysemethoden charakterisiert.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


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

P (6)

Module taught in: German or English

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/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

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### Module coordinator

| Lecture of lecture "Supramolekularen Chemie (Organische Chemie/Physikalische Chemie)" |
| Institute of Organic Chemistry |

### ECTS

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### Contents

The module deepens special synthetic and analytical methods of Supramolecular Chemistry. The students work independently in the laboratory, record their research results and present them in a talk.

### Intended learning outcomes

The students are able to carry out demanding synthetic and analytical methods in the field of Supramolecular Chemistry experimentally and to evaluate the results. He/She can present their research results in a talk.

### Courses

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### Method of assessment

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- presentation (approx. 20 minutes)
- Language of assessment: German and/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)
Subfield Other additional qualifications
(10 ECTS credits)
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<td>Faculty of Chemistry and Pharmacy</td>
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<td>It is not permitted to use activities performed under a research assistant contract for this module. The tutorial must accompany a different course than the tutorial held in module 08-WRM1.</td>
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**Contents**

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

**Intended learning outcomes**

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

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

T (3)

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

Tutoring activities, (preparation of status and/or wrap-up reports, approx. 100 hours total) Language of assessment: German and/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>Tutoring 2 (practical course)</td>
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**Module coordinator**
Dean of Studies Chemie (Chemistry)

**Module offered by**
Faculty of Chemistry and Pharmacy

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**Duration**
1 semester

**Module level**
graduate

**Other prerequisites**
It is not permitted to use activities performed under a research assistant contract for this module. The tutorial must accompany a different course than the tutorial held in module 08-WRM1.

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

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

<table>
<thead>
<tr>
<th><strong>Courses</strong> (type, number of weekly contact hours, language — if other than German)</th>
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**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
Tutoring activities, (preparation of status and/or wrap-up reports, approx. 100 hours total)
Language of assessment: German and/or English

**Allocation of places**
--

**Additional information**
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**Referred to in LPO I** (examination regulations for teaching-degree programmes)
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<table>
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**Module coordinator**

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</table>

**Contents**

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

**Intended learning outcomes**

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

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

P (0) Module taught in: German and/or English and potentially language of the respective country

**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) report (10 to 20 pages) or b) talk (10 to 20 minutes)

Language of assessment: German and/or English and potentially language of the respective country

**Allocation of places**

--

**Additional information**

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

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### Module Catalogue for the Subject Chemistry

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

<table>
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<td>Foreign Studies (long)</td>
<td>08-APM2-161-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erasmus programme coordinator Chemie (Chemistry)</td>
<td>Faculty of Chemistry and Pharmacy</td>
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<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>graduate</td>
<td>May not be combined with 08-APM1.</td>
</tr>
</tbody>
</table>

### Contents

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

### Intended learning outcomes

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

### Courses

**P (0)**

Module taught in: German and/or English and potentially language of the respective country

### Method of assessment

<table>
<thead>
<tr>
<th>Type</th>
<th>Scope</th>
<th>Language</th>
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</tr>
</thead>
<tbody>
<tr>
<td>a) report</td>
<td>(15 to 30 pages)</td>
<td>German and/or English and potentially language of the respective country</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>b) talk</td>
<td>(15 to 30 minutes)</td>
<td>German and/or English and potentially language of the respective country</td>
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</table>

### Allocation of places

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### Additional information

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### Referred to in LPO 1

(examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Chemistry-related competences outside of the Natural Sciences</td>
<td>08-CHPM1-161-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
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<tbody>
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<td>Dean of Studies Chemie (Chemistry)</td>
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<table>
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<tbody>
<tr>
<td>Faculty of Chemistry and Pharmacy</td>
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<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
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<td>graduate</td>
<td>Please consult with course advisory service in advance.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>German contents available but not translated yet.</td>
</tr>
</tbody>
</table>

Das Modul bietet die Möglichkeit, chemienahe Veranstaltungen anderer Fachbereiche, die nicht explizit in der Studienordnung vorgesehen sind, anrechnen zu lassen. Eine vorherige Rücksprache mit der Fachstudienberatung ist zwingend notwendig.

<table>
<thead>
<tr>
<th>Intended learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>German intended learning outcomes available but not translated yet.</td>
</tr>
</tbody>
</table>

Die Studierenden erwerben Kompetenzen entsprechend der besuchten Veranstaltungen.

<table>
<thead>
<tr>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>No courses assigned to module</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method of assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)</td>
</tr>
<tr>
<td>a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)</td>
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<table>
<thead>
<tr>
<th>Language of assessment: German and/or English</th>
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<table>
<thead>
<tr>
<th>Allocation of places</th>
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<table>
<thead>
<tr>
<th>Additional information</th>
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<table>
<thead>
<tr>
<th>Referred to in LPO I (examination regulations for teaching-degree programmes)</th>
</tr>
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<tbody>
<tr>
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</table>
## Module Catalogue for the Subject Chemistry

Master's with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Chemistry-related competences within the Natural Sciences</td>
<td>08-CHPM2-161-m01</td>
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</table>

### Module coordinator
Dean of Studies Chemie (Chemistry)

### Module offered by
Faculty of Chemistry and Pharmacy

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

### Duration
1 semester

### Module level
graduate

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

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

Das Modul bietet die Möglichkeit, chemienahe Veranstaltungen anderer Fachbereiche, die nicht explizit in der Studienordnung vorgesehen sind, anrechnen zu lassen. Eine vorherige Rücksprache mit der Fachstudienberatung ist zwingend notwendig.

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

Die Studierenden erwerben Kompetenzen entsprechend der besuchten Veranstaltungen.

### Courses
No courses assigned to module

### Method of assessment
(a) written examination (approx. 90 to 180 minutes) or (b) oral examination of one candidate each (20 to 30 minutes) or (c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or (d) log (approx. 20 pages) or (e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

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

--
### Module title
Chemistry-related competences outside of the Natural Sciences acquired abroad

### Abbreviation
08-CHPM3-161-m01

### Module coordinator
Dean of Studies Chemie (Chemistry)

### Module offered by
Faculty of Chemistry and Pharmacy

### ECTS
5

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

### (not) successfully completed
--

### Duration
1 semester

### Module level
graduate

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

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

Das Modul bietet die Möglichkeit, chemienahe Veranstaltungen anderer Fachbereiche, die nicht explizit in der Studienordnung vorgesehen sind, anrechnen zu lassen. Eine vorherige Rücksprache mit der Fachstudienberatung ist zwingend notwendig.

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

Die Studierenden erwerben Kompetenzen entsprechend der besuchten Veranstaltungen.

### Courses
No courses assigned to module

Module taught in: German and/or English and potentially language of the respective country

### Method of assessment
(a) written examination (approx. 90 to 180 minutes) or (b) oral examination of one candidate each (20 to 30 minutes) or (c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or (d) log (approx. 20 pages) or (e) presentation (approx. 30 minutes)

Language of assessment: German and/or English and potentially language of the respective country

### Allocation of places
--

### Additional information
--

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

--
## Module title

Chemistry-related competences within the Natural Sciences acquired abroad

### Abbreviation

08-CHPM4-161-m01

## Module coordinator

Dean of Studies Chemie (Chemistry)

## Module offered by

Faculty of Chemistry and Pharmacy

## ECTS

5

## Method of grading

Only after succ. compl. of module(s)

## Duration

1 semester

## Module level

undergraduate

## Other prerequisites

Please consult with course advisory service in advance.

## Contents

German contents available but not translated yet.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

### Courses

No courses assigned to module

### Method of assessment

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Thesis
(30 ECTS credits)
### Module Catalogue for the Subject Chemistry

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

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Master-Thesis Chemistry</td>
<td>08-MA-161-m01</td>
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**Module coordinator**
- degree programme coordinator Chemie (Chemistry)

**Module offered by**
- Faculty of Chemistry and Pharmacy

<table>
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<th>ECTS</th>
<th>Method of grading</th>
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<tr>
<td>30</td>
<td>numerical grade</td>
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</tr>
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</table>

**Duration**
- graduate

**Other prerequisites**
- Where applicable, specific modules as specified by supervisor.

### 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**
- No courses assigned to module

**Method of assessment**
- Master's thesis (approx. 60 to 80 pages)
- Language of assessment: German and/or English

**Allocation of places**
- --

**Additional information**
- --

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

(35 ECTS credits)

This and the following areas are designed for students of Chemistry who take part in an exchange programme in accordance with the provisions of Annex DA of the relevant FSB (subject-specific provisions).
Subfield Courses at partner university abroad
(5 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Toxicology and legal studies</td>
<td>03-TR-152-m01</td>
</tr>
</tbody>
</table>

### Module coordinator
Lecturer of lecture "Toxikologie und Rechtskunde"

### Module offered by
Faculty of Medicine

### ECTS
3

### Method of grading
Numerical grade

### 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 (1) + V (1)

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

### Allocation of places
--

### Additional information
--

### Referred to in LPO I (examination regulations for teaching-degree programmes)
§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced chemical practical course</td>
<td>08-VPM-DA-161-m01</td>
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<table>
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<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>head of the research group offering the module</td>
<td>Faculty of Chemistry and Pharmacy</td>
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<table>
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<th>Module level</th>
<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</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 (3)

**Method of assessment**

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

report (approx. 3 pages)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Subfield Courses at partner university abroad
(30 ECTS credits)
### Module Catalogue for the Subject Chemistry

**Module title**: Qualifications - Partner University

**Module coordinator**: programme coordinator of the exchange programme

**Module offered by**: Faculty of Chemistry and Pharmacy

**ECTS**: 30

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

**Duration**: 1 semester

**Module level**: graduate

**Other prerequisites**: Please consult with course advisory service in advance.

**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**

No courses assigned to module

**Method of assessment**

Assessments as specified by partner university abroad

Language of assessment: German and/or language spoken at partner university abroad

**Allocation of places**

--

**Additional information**

--

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

--
Compulsory Electives (double degree)
(55 ECTS credits)

Students must take one focus with 25 ECTS credits as well as one focus with 30 ECTS credits (focuses 1 and 2 pursuant to Section 3 Subsection 2 FSB (subject-specific provisions) Annex DA), provisions on available combinations are set out in Section 3 Subsection 2 Sentence 8 FSB.
Inorganic Chemistry
(25 or 30 ECTS credits)
Compulsory Courses

(20 ECTS credits)
<table>
<thead>
<tr>
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<th>Abbreviation</th>
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<tbody>
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<td>Advanced Inorganic Chemistry</td>
<td>08-ACM1-161-m01</td>
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<thead>
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<th>Module coordinator</th>
<th>Module offered by</th>
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</thead>
<tbody>
<tr>
<td>Managing Director of the Institute of Inorganic Chemistry</td>
<td>Institute of Inorganic Chemistry</td>
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<table>
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</thead>
<tbody>
<tr>
<td>2 semester</td>
<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezifische Themen der Hauptgruppen- und Übergangsmetallchemie. Schwerpunkte sind spezielle Verbindungen der Hauptgruppenelemente (HGE), Bindungssituation in HGE und HGE-Verbindungen, Stoffchemie der Übergangsmetalle und Koordinationschemie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, spezielle Verbindungen der Hauptgruppenelemente zu charakterisieren und erklären. Er/Sie kann stoffchemische Eigenschaften von Übergangsmetallen beschreiben und Struktur sowie chemische und physikalische Aspekte von Koordinationsverbindungen analysieren.

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

S (3) + S (3)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

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<table>
<thead>
<tr>
<th><strong>Module title</strong></th>
<th><strong>Abbreviation</strong></th>
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<tbody>
<tr>
<td>Inorganic Chemistry practical course for advanced</td>
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<th><strong>Module coordinator</strong></th>
<th><strong>Module offered by</strong></th>
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</thead>
<tbody>
<tr>
<td>focus point coordinator &quot;Inorganic Chemistry&quot;</td>
<td>Institute of Inorganic Chemistry</td>
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<th><strong>Method of grading</strong></th>
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<thead>
<tr>
<th><strong>Duration</strong></th>
<th><strong>Module level</strong></th>
<th><strong>Other prerequisites</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>--</td>
<td>graduate</td>
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</tbody>
</table>

**Contents**

German contents available but not translated yet.

Das Modul vertieft spezielle Synthese- und Analysemethoden der anorganischen Chemie. Im Schwerpunkt steht das Arbeiten unter Inertgas, Reinigungsmethoden, Spektrenanalyse sowie Kristallographie. Die Studierenden arbeiten selbständig im Labor, halten ihre Forschungsergebnisse in einem Praktikumsbericht fest und präsentieren diese in einem Vortrag.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, anspruchsvolle anorganische Synthese- und Analysemethoden experimentell durchzuführen sowie die erhaltenen Ergebnisse auszuwerten. Er/Sie kann Forschungsergebnisse in einem wissenschaftlichen Bericht formulieren und in einem Vortrag präsentieren.

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

P (24)

Module taught in: German or English

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

- report on practical course (approx. 20 pages) and talk (approx. 15 minutes)
- Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

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Compulsory Electives
(5 or 10 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Basics and applications of quantum chemistry</td>
<td>08-TCM2-161-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecturer of lecture &quot;Computational Chemistry&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<tr>
<th>ECTS</th>
<th>Method of grading</th>
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<thead>
<tr>
<th>Duration</th>
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<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
</tr>
</tbody>
</table>

**Contents**

The module introduces students to computational chemistry.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

<table>
<thead>
<tr>
<th>Courses (type, number of weekly contact hours, language — if other than German)</th>
</tr>
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<tbody>
<tr>
<td>S (2) + Ü (2)</td>
</tr>
</tbody>
</table>

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Bioinorganic Chemistry</td>
<td>08-ACM2-161-m01</td>
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<th>Module coordinator</th>
<th>Module offered by</th>
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<tr>
<td>lecturer of seminar &quot;Anorganische Aspekte der Biochemie and Medizinischen Chemie&quot; (Inorganic Aspects of Biochemistry and Medicinal Chemistry)</td>
<td>Institute of Inorganic Chemistry</td>
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<th>ECTS</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</tbody>
</table>

**Contents**

German contents available but not translated yet.

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

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


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

S (3)

Module taught in: German or English

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Module title: Solid state chemistry and inorganic materials  
Abbreviation: 08-AC3-3161-m01

Module coordinator: Lecturer of seminar "Festkörperchemie and Anorganische Materialien" (Solid State Chemistry and Inorganic Materials)
Module offered by: Institute of Inorganic Chemistry

ECTS: 5  
Method of grading: Only after succ. compl. of module(s)
Duration: 1 semester  
Module level: graduate

Contents
German contents available but not translated yet.
Das Modul führt in die Festkörperchemie ein. Schwerpunkte sind Struktur, chemische und physikalische Eigenschaften, Synthesemethoden sowie ausgewählte Materialien von Festkörpern.

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 (3)

Method of assessment
(type, scope, language — if other than German, examination offered — If not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)
Language of assessment: German and/or English

Allocation of places
--

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Module title: Advanced organometallic chemistry and its application in homogeneous catalysis

Abbreviation: 08-HKM2-161-m01

Module coordinator: Lecturer of the seminar "Spezielle Metallorganische Chemie and deren Anwendung in der Homogenkatalyse"

Module offered by: Institute of Inorganic Chemistry

ECTS: 5

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

Numerical grade: --

Duration: 1 semester

Module level: Graduate

Other prerequisites: --

Contents:
German contents available but not translated yet.

Das Modul bietet die Möglichkeit, Elementorganische Verbindungen der Übergangsmetalle mit homogenkatalytischen Anwendungen im Detail zu betrachten.

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 (3)

Module taught in: German or English

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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):
--
Organic Chemistry
(25 or 30 ECTS credits)
Compulsory Courses

(15 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
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<tbody>
<tr>
<td>Modern Synthetic Methods</td>
<td>08-OCM-SYNT-161-m01</td>
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<tr>
<td>lecturer of the seminar</td>
<td>Institute of Organic Chemistry</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul behandelt moderne stereoselektive Synthesemethoden. Schwerpunkt sind ausgewählte Totalsynthesen, Organometallchemie und Katalyse.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, anspruchsvolle chemische Synthesen stereoselektiv zu planen sowie stereosemisch zu analysieren. Er/Sie kann Totalsynthesen erklären. Er/Sie kann Aspekte der Organometallchemie und Katalyse in der Synthesechemie darstellen.

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

S (2) + Ü (1)

Module taught in: German or English

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
### Module title
Advanced Research Project Organic Chemistry

### Abbreviation
08-OCM-AKP1-161-m01

### Module coordinator
head of the research group offering the module

### Module offered by
Institute of Organic Chemistry

### ECTS
10

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

### (not) successfully completed
--

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

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

Das Modul bietet den Studierenden die Möglichkeit, in einem Arbeitskreis des Instituts für Organische Chemie mit zu arbeiten sowie spezifische Synthese- und Analysemethoden kennen zu lernen.

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

Die Studierenden sind in der Lage, arbeitskreisotypische synthetische, analytische und theoretische forschungsrelevante Inhalte zu beschreiben sowie anzuwenden.

### Courses
(P 20)
Module taught in: German or English

### Method of assessment
(Log (approx. 15 to 20 pages) and talk (approx. 15 minutes)
Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

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

--
Compulsory Electives

(10 or 15 ECTS credits)
Module title: Organo- and Biocatalysis

Abbreviation: 08-HKM1-152-m01

Module coordinator: Lecturer of the seminar "Organo- and Biokatalyse"

Module offered by: Faculty of Chemistry and Pharmacy

ECTS: 5

Method of grading: Numerical grade

Duration: 1 semester

Module level: Graduate

Other prerequisites: --

Contents:

German contents available but not translated yet.


Intended learning outcomes:

German intended learning outcomes available but not translated yet.


Courses:

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

S (3)

Method of assessment:

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/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)

--
### Practical course of clinical-analytical Chemistry

**Module title**
Practical course of clinical-analytical Chemistry

**Abbreviation**
08-PH-KACP-152-m01

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

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

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</table>

**Duration**
1 semester

**Module level**
Undergraduate

**Other prerequisites**
--

### Contents

German contents available but not translated yet.

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

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

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

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

- **P (5)**

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

--

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

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<table>
<thead>
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<td>lecturer of lecture &quot;Bioorganische Chemie&quot; (Bioorganic Chemistry)</td>
<td>Institute of Organic 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)

S (3)

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/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>Supramolecular Chemistry (Basics)</td>
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**Module coordinator**

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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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

S (3)

**Method of assessment**

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)

Language of assessment: German and/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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<td>Basics and applications of quantum chemistry</td>
<td>08-TCM2-161-m01</td>
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<tr>
<td>lecture of lecture &quot;Computational Chemistry&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<td>1 semester</td>
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</table>

**Contents**
The module introduces students to computational chemistry.

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

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

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

S (2) + Ü (2)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**
--

**Additional information**
--

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

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<table>
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<tr>
<td>Modern Aspects of Natural Product Chemistry and Biological Chemistry</td>
<td>08-OCM-NAT-161-m01</td>
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**Module coordinator**

Name of the seminar lecturer

Institute of Organic Chemistry

**ECTS**

5

**Method of grading**

Numerical grade

**Duration**

1 semester

**Module level**

Graduate

**Other prerequisites**

--

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezielle Themen der Naturstoffchemie und Biologischer Chemie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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

**Courses**

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

S (3)

Module taught in: German or English

**Method of assessment**

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

MA Chemie: unbegrenzt, Ma Biochemie: 20 places. Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

--

**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>Organic Functional Materials</td>
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<tbody>
<tr>
<td>lecturer of the seminar &quot;Organische Funktionsmaterialien&quot;</td>
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<td>1 semester</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezifische Themen der organischen Funktionsmaterialien. Schwerpunkte sind grundlegende physikalische Effekte, organische Festkörper, Anwendung organischer Funktionsmaterialien und organische und metallorganische Polymerchemie.

**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 (3)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Physical Chemistry
(25 or 30 ECTS credits)
Compulsory Courses

(20 ECTS credits)
Module title | Abbreviation
--- | ---
Laser Spectroscopy | 08-PCM1a-161-m01

Module coordinator | Module offered by
lecturer of seminar "Laserspektroskopie" (Laser Spectroscopy) | Institute of Physical and Theoretical Chemistry

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</table>

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

Contents
German contents available but not translated yet.

Das Modul führt in die Grundlagen der Laserspektroskopie ein. Als experimentelle Methoden werden die Absorptions- und Emissionsspektroskopie behandelt.

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

Die Studierenden sind in der Lage, Aufbau und Funktionsweise eines Lasers sowie die optischen Grundlagen zu erklären. Er/Sie kann das Prinzip der Absorptions- und Emissionsspektroskopie darstellen.

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

S (2) + Ü (1)
Module taught in: German or English

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)
Language of assessment: German and/or English

Allocation of places
--

Additional information
--

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

<table>
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<tr>
<td>Advanced Physical Chemistry (Lab)</td>
<td>08-PCM1b-161-m01</td>
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#### Module coordinator
- Lecturer of seminar "Laserspektroskopie" (Laser Spectroscopy)

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

#### ECTS
- 5

#### Method of grading
- Only after successfully completed module(s)

#### Duration
- Graduate

#### Contents

German contents available but not translated yet.


#### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden können moderne experimentelle Methoden der Physikalischen Chemie sicher praktisch durchführen. Er/Sie kann erhaltene Messwerte inhaltlich und graphisch mit geeigneten Computerprogrammen sowie rechnerisch analysieren und in einem wissenschaftlichen Protokoll formulieren.

#### Courses

P (4)

Module taught in: German or English

#### Method of assessment

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

#### Allocation of places

- 

#### Additional information

- 

#### Referred to in LPO I

(examination regulations for teaching-degree programmes)
# Module Catalogue for the Subject Chemistry
## Master's with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Statistical Mechanics and Reaction Dynamics</td>
<td>08-PCM2-161-m01</td>
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<th>Module offered by</th>
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<tbody>
<tr>
<td>lecturer of seminar &quot;Chemische Dynamik&quot; (Chemical Dynamics)</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<tbody>
<tr>
<td>1 semester</td>
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</table>

### Contents
The module deals with selected contents of statistical mechanics and reaction dynamics. It introduces the basic principles of statistical thermodynamics and conveys the transition state theory. Other topics are unimolecular and bimolecular reactions as well as charge and energy transfer.

### Intended learning outcomes
The students are familiar with selected contents of statistical mechanics and reaction dynamics. They know the basic principles of statistical thermodynamics and can apply them.

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

S (2) + Ü (1)
Module taught in: German or English

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)
or c) talk (approx. 30 minutes)
Language of assessment: German and/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>Physical Chemistry (Advanced Lab)</td>
<td>08-PCM6-161-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>Physikalische Chemie (Physical Chemistry)</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<th>Method of grading</th>
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<th>Module level</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>graduate</td>
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</tbody>
</table>

**Contents**

German contents available but not translated yet.

Das Modul bietet den Studierenden die Möglichkeit, in einem Arbeitskreis des Instituts für Physikalische Chemie mit zu arbeiten sowie spezifische Synthese- und Analysemethoden kennen zu lernen.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden können für einen Arbeitskreis der Physikalischen Chemie typische Untersuchungsmethoden anwenden sowie die erhaltenen Ergebnisse analysieren um aktuelle Fragestellungen der Physikalischen Chemie zu beantworten.

**Courses**

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

P (4)
Module taught in: German or English

**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. 20 minutes)
Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Compulsory Electives
(5 or 10 ECTS credits)
### Module title

Material Science 1 (Basic introduction)

### Abbreviation

08-FU-MaWi1-152-m01

### Module coordinator

holder of the Chair of Chemical Technology of Material Synthesis

### Module offered by

Chair of Chemical Technology of Material Synthesis

### ECTS

5

### Method of grading

numerical grade

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

--

### Duration

1 semester

### Module level

undergraduate

### Other prerequisites

--

### Contents


### Intended learning outcomes

The students possess comprehensive knowledge about various techniques form different areas of the field of chemical process engineering. For a given objective they are able to weigh the pros and cons of different techniques and can suggest ways of fabrication, processing and treatment of materials. Furthermore they are confident in handling of measurement data as well as statistical and systematic errors and possess extensive knowledge about nomenclature, significance as well as practically determining characteristic material properties.

### Courses

<table>
<thead>
<tr>
<th>(type, number of weekly contact hours, language</th>
<th>if other than German)</th>
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</thead>
<tbody>
<tr>
<td>V (3) + Ü (1)</td>
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</table>

### Method of assessment

- **a)** written examination (approx. 90 to 180 minutes) or
- **b)** oral examination of one candidate each (20 to 30 minutes) or
- **c)** oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or
- **d)** log (approx. 20 pages) or
- **e)** presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title: Nanoscale Materials
Abbreviation: 08-PCM3-161-m01

Module coordinator: Lecturer of the seminar "Nanoskalige Materialien"
Module offered by: Institute of Physical and Theoretical Chemistry

ECTS: 5
Method of grading: Numerical grade
Duration: 1 semester
Module level: Graduate
Other prerequisites: --

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, nanoskalige Materialien zu charakterisieren. Er/Sie kann Analysenmethoden sowie Anwendungsgebiete nanoskaliger Materialien anführen.

Courses:
S (2) + Ü (1)
Module taught in: German or English

Method of assessment:
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)
Language of assessment: German and/or English

Allocation of places:
--

Additional information:
--

Referred to in LPO I (examination regulations for teaching-degree programmes):
--
### Module title
Ultrafast spectroscopy and quantum-control

### Abbreviation
08-PCM4-161-m01

### Module coordinator
Lecturer of the seminar "Nanoskalige Materialien"

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

### ECTS
5

### Method of grading
Numerical grade

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

### Duration
1 semester

### Module level
Graduate

### Other prerequisites
Prior completion of modules 08-PCM1a and 08-PCM1b recommended.

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

Das Modul behandelt spezielle Themen der Ultrakurzzeitspektroskopie und Quantenkontrolle. Schwerpunkte sind ultrakurze Laserpulse, zeitaufgelöste Laserspektroskopie sowie kohärente Kontrolle.

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


### Courses

<table>
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<tr>
<th>Type</th>
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<th>Language</th>
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<tr>
<td>Ü</td>
<td>(1)</td>
<td>German or English</td>
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</table>

Module taught in: German or English

### Method of assessment

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

### Referred to in LPO I
(examination regulations for teaching-degree programmes)
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<table>
<thead>
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<tbody>
<tr>
<td>Physical chemistry of supramolecular assemblies</td>
<td>08-PCM5-161-m01</td>
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**Module coordinator**

I. The Seminar "Physikalische Chemie Supramolekularer Strukturen"

**Module offered by**

Institute of Physical and Theoretical Chemistry

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</tbody>
</table>

**Duration**

1 semester

**Module level**

Graduate

**Other prerequisites**

--

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

S (2) + Ü (1)

Module taught in: German or English

**Method of assessment**

(a) written examination (approx. 90 minutes) or (b) oral examination of one candidate each (approx. 20 minutes) or (c) talk (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
## Basics and applications of quantum chemistry

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<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Basics and applications of quantum chemistry</td>
<td>08-TCM2-161-m01</td>
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</table>

### Module coordinator
Lecturer of lecture "Computational Chemistry"

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

### ECTS
- **5**

### Method of grading
- Numerical grade

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

### Duration
- 1 semester

### Module level
- Graduate

### Other prerequisites
- --

### Contents

The module introduces students to computational chemistry.

### Intended learning outcomes

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

### Courses

- **S (2) + Ü (2)**

### Method of assessment

- a) written examination (approx. 90 to 180 minutes) or
- b) oral examination of one candidate each (20 to 30 minutes) or
- c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or
- d) log (approx. 20 pages) or
- e) presentation (approx. 30 minutes)

**Language of assessment:** German and/or English

### Allocation of places

- --

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)
<table>
<thead>
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<th>Module title</th>
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<td>Numerical Methods and Programming</td>
<td>08-TCM3-161-m01</td>
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<tbody>
<tr>
<td>lecturer of lecture &quot;Programmieren in Theoretischer Chemie&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

### Contents

German contents available but not translated yet.

Das Modul führt in Grundlagen der Programmierung in der Theoretischen Chemie ein und zeigt Anwendungsgebiete auf.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden können eine in der Theoretischen Chemie verwendete Programmiersprache theoretisch erklären und praktisch anwenden sowie Anwendungsmöglichkeiten anführen.

### Courses

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

S (2) + Ü (2)

### Method of assessment

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
## Module title

**Selected topics in theoretical chemistry**

## Abbreviation

08-TCM1-161-m01

## Module coordinator

Lecturer of lecture "Theoretische Chemie"

## Module offered by

Institute of Physical and Theoretical Chemistry

## ECTS

<table>
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<tr>
<th>Method of grading</th>
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## Duration

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<tbody>
<tr>
<td>graduate</td>
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</table>

## Contents

The module introduces students to theoretical chemistry.

## Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden können mathematische und physikalische Grundlagen quantenchemischer und quantendynamischer Ansätze der Theoretischen Chemie darstellen.

## Courses

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

| S (2) + Ü (2) |

## Method of assessment

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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 Chemistry - Project course quantum chemistry</td>
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<td>Institute of Physical and Theoretical Chemistry</td>
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</table>

**Contents**

The module offers students the opportunity to work in a group of the Institute for Theoretical Chemistry as well as to become familiar with typical working methods. The main focus of the practical course is Quantum Chemistry.

**Intended learning outcomes**

The students are able to apply typical working methods of the Theoretical Chemistry, especially in the area of Quantum Chemistry. He/She can explain specific contents of Quantum Chemistry.

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

<table>
<thead>
<tr>
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<th>Language</th>
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**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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

**Allocation of places**

--

**Additional information**

--

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

--
### Module Catalogue for the Subject Chemistry

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

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Theoretical Chemistry - Project course quantum dynamics</td>
<td>08-TCAP2-161-m01</td>
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<tr>
<td></td>
<td>graduate</td>
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</table>

#### Contents

The module offers students the opportunity to work in a group of the Institute for Theoretical Chemistry as well as to become familiar with typical working methods. The main focus of the practical course is Quantum Dynamics.

#### Intended learning outcomes

The students are able to apply typical working methods of the Theoretical Chemistry, especially in the area of Quantum Dynamics. He/She can explain specific contents of Quantum Dynamics.

#### Courses

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

- P (5)

#### 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 and/or English

#### Allocation of places

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#### Additional information

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

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<table>
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<tr>
<td>lecturers specialisation subject Funktionsmaterialien (Functional Materials)</td>
<td>Chair of Chemical Technology of Material Synthesis</td>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Im Rahmen des Moduls werden zehn Experimente mit materialwissenschaftlichem Bezug aus einer größeren Auswahl durchgeführt.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über spezielle Kenntnisse in der Durchführung materialwissenschaftlicher Experimente.

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

P (8)

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

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

--
Biochemistry
(25 or 30 ECTS credits)
Compulsory Courses

(15 ECTS credits)
## Module title
Molecular Biology laboratory course

## Abbreviation
08-BC-MOLP-152-m01

## Module coordinator
holder of the Chair of Biochemistry

## Module offered by
Faculty of Chemistry and Pharmacy

## ECTS
10

## Method of grading
Numerical grade

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

## Duration
1 semester

## Module level
Undergraduate

## Other prerequisites
--

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

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

## Courses
(type, number of weekly contact hours, language — if other than German)
P (5)

## Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 45 to 90 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (20 to 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 to 20 minutes per candidate) or e) presentation (20 to 30 minutes) or f) practical examination (on average approx. 2 hours; time to complete will vary according to subject area but will not exceed a maximum of 4 hours)

Assessment offered: Once a year, winter semester

Language of assessment: German and/or English

## Allocation of places
Biochemie (Biochemistry), Bachelor’s: 24 places. Selection process Biochemie (Biochemistry), Bachelor’s (180 ECTS credits): Should the number of applications exceed the number of available places, places will be allocated according to the following quotas: Quota 1 (two thirds of places): current average grade of successfully completed modules; among applicants with the same average grade, places will be allocated by lot. Quota 2 (one third of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

Chemie (Chemistry), Master’s: 6 places. Selection process Chemie (Chemistry), Bachelor’s (120 ECTS credits): Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.

## Additional information
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## Referred to in LPO I
(examination regulations for teaching-degree programmes)
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<table>
<thead>
<tr>
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<th>Abbreviation</th>
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<tbody>
<tr>
<td>Molecular Biology for advanced students</td>
<td>08-BC-MOLMC-161-m01</td>
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**Module coordinator**
holder of the Chair of Biochemistry

**Module offered by**
Chair of Biochemistry

<table>
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</table>

**Duration**
1 semester

**Module level**
graduate

**Other prerequisites**
--

**Contents**
The module covers specific topics of molecular physiology and functional biochemistry in lectures and exercises.

**Intended learning outcomes**
After attending the module events, students have solid knowledge in molecular biology.

**Courses** (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (1)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**
--

**Additional information**
--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)
--
Compulsory Electives
(10 or 15 ECTS credits)
Module title | Abbreviation
--- | ---
Organo- and Biocatalysis | 08-HKM1-152-m01

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

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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

S (3)

**Method of assessment**

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/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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<tr>
<td>Pharmazeutische Chemie (Pharmaceutical Chemistry)</td>
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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

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

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

S (2) + Ü (1)

Module taught in: German or English

**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 with discussion (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

20 places. 4 places for students of the Master's degree programme Chemie (Chemistry): Places will be allocated according to the same number of subject semesters; students who have chosen Medizinische Chemie (Medicinal Chemistry) as their focus will be given preferential consideration; among applicants with the same number of subject semesters, places will be allocated by lot.; 6 places for students of the Master's degree programme Biochemie (Biochemistry): Places will be allocated according to the number of subject semesters; among applicants with the same number of subject semesters, places will be allocated by lot; a waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

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

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<table>
<thead>
<tr>
<th>Module title</th>
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<tr>
<td>Clinical-analytical Chemistry</td>
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<td>lecturer of lecture &quot;Klinisch-analytische Chemie&quot; (Clinical and Analytical Chemistry)</td>
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**Contents**

This module covers specific topics of clinical analytical chemistry.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über Fortgeschrittenkenntnisse der Molekularbiologie.

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

V (3)  

**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. 120 minutes)  
Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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<tr>
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</table>

**Contents**

German contents available but not translated yet.

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

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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

**Courses**

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

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**Method of assessment**

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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### Module title
Bioinorganic Chemistry

### Abbreviation
08-ACM2-161-m01

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

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

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


### Courses
S (3)
Module taught in: German or English

### Method of assessment
(a) written examination (approx. 45 to 90 minutes) or (b) oral examination of one candidate each (20 to 30 minutes) or (c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/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>lecturer of the seminar</td>
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**Contents**

German contents available but not translated yet.

Das Modul behandelt spezielle Themen der Naturstoffchemie und Biologischer Chemie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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

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

S (3)

Module taught in: German or English

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

MA Chemie: unbegrenzt, Ma Biochemie: 20 places. Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

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

--
Module title
Practical course "Molecular Machines" for advanced students

Abbreviation
08-BC-VPMM-161-m01

Module coordinator
holder of the Chair of Biochemistry

Module offered by
Chair of Biochemistry

ECTS
10

Method of grading
numerical grade

Only after succ. compl. of module(s)
o8-BC-MOLP

Duration
graduate

Other prerequisites
--

Contents
German contents available but not translated yet.

Das Modul ermöglicht ein vertieftes Einarbeiten in ein Forschungsthema. Ausgewählte Methoden und Themen der Molekularbiologie und Biochemie; Klonierung, Mutagenese, Proteinexpression und -aufreinigung, RNA-Protein- und Protein-Protein Interaktionsstudien, Isolierung und funktionelle Analyse von makromolekularen Komplexen.

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

Courses
P (10)

Method of assessment
Log (approx. 20 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

Allocation of places
--

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

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## Module title

**Practical course "Protein Degradation in Eukaryotes" for advanced students**

### Abbreviation

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### Module coordinator

holder of the Chair of Biochemistry

### Module offered by

Chair of Biochemistry

### Contents

German contents available but not translated yet.

Das Modul ermöglicht ein vertieftes Einarbeiten in ein Forschungsthema auf dem Gebiet der Proteindegradation in Eukaryoten.

### Intended learning outcomes

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

### Courses

**P (10)**

### Method of assessment

Log (approx. 20 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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### Contents


### Intended learning outcomes

Der/Die Studierende beherrscht es, sich in ein Forschungsthema vertieft einzuarbeiten sowie die Ergebnisse im Rahmen eines Vortrags darzustellen. Der/Die Studierende ist in der Lage, mittels unterschiedlicher Methoden, verschiedene Mechanismen der allgemeinen und spezifischen Translationskontrolle entsprechend selbständig zu erarbeiten, die Ergebnisse fachgerecht aufzubereiten und verständlich zu präsentieren.

### Courses

P (10)

### Method of assessment

Log (approx. 20 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

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### Referred to in LPO I

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Functional Materials
(25 or 30 ECTS credits)
Compulsory Courses

(20 ECTS credits)
## Module title
Material Science 1 (Basic introduction)

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## Module coordinator
holder of the Chair of Chemical Technology of Material Synthesis

## Module offered by
Chair of Chemical Technology of Material Synthesis

## ECTS
5

## Duration
1 semester

## Contents

## Intended learning outcomes
The students possess comprehensive knowledge about various techniques from different areas of the field of chemical process engineering. For a given objective they are able to weigh the pros and cons of different techniques and can suggest ways of fabrication, processing and treatment of materials. Furthermore they are confident in handling of measurement data as well as statistical and systematic errors and possess extensive knowledge about nomenclature, significance as well as practically determining characteristic material properties.

## Courses
(V (3) + Ü (1))

## Method of assessment
(a) written examination (approx. 90 to 180 minutes) or (b) oral examination of one candidate each (20 to 30 minutes) or (c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or (d) log (approx. 20 pages) or (e) presentation (approx. 30 minutes)

Language of assessment: German and/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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</table>

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezifische Themen der organischen Funktionsmaterialien. Schwerpunkte sind grundlegende physikalische Effekte, organische Festkörper, Anwendung organischer Funktionsmaterialien und organische und metallorganische Polymerchemie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Module title

Lab Course Material Science

Abbreviation

08-FMM-MP-161-m01

Module coordinator

Lecturers specialisation subject Funktionsmaterialien (Functional Materials)

Module offered by

Chair of Chemical Technology of Material Synthesis

ECTS

5

Method of grading

Only after succ. compl. of module(s)

(Not) successfully completed

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Duration

1 semester

Module level

Graduate

Other prerequisites

--

Contents

German contents available but not translated yet.

Im Rahmen des Moduls werden zehn Experimente mit materialwissenschaftlichem Bezug aus einer größeren Auswahl durchgeführt.

Intended learning outcomes

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über spezielle Kenntnisse in der Durchführung materialwissenschaftlicher Experimente.

Courses

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

P (8)

Method of assessment

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/or English

Allocation of places

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Additional information

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Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<tr>
<td>head of the research group offering the module</td>
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**Contents**

German contents available but not translated yet.

Im Rahmen des Moduls erfolgt eine angeleitete vertiefte Einarbeitung in ein Forschungsthema sowie die Darstellung der erhaltenen Ergebnisse.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende verfügt über spezielle Kenntnisse in der Durchführung materialwissenschaftlicher Experimente.

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

P (10)

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

Log (approx. 15 pages) and talk (approx. 15 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
Compulsory Electives

(5 or 10 ECTS credits)
## Module title
Supramolecular Chemistry (Basics)

### Abbreviation
08-SCM1-152-m01

### Module coordinator
Lecturer of lecture "Organischen Chemie"

### Module offered by
Faculty of Chemistry and Pharmacy

### ECTS
5

### Method of grading
Numerical grade

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

### Duration
1 semester

### Module level
Graduate

### Other prerequisites
--

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


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


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

S (3)

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

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

--
### Module title

**Molecular Materials (Lecture)**

| Abbreviation | 08-FU-MoMaV-152-m01 |

### Module coordinator

Degree programme coordinator Funktionswerkstoffe (Functional Materials)

### Module offered by

Chair of Chemical Technology of Material Synthesis

### ECTS

<table>
<thead>
<tr>
<th>Method of grading</th>
<th>Only after succ. compl. of module(s)</th>
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### Duration

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

### Contents

Chemical bonds and molecular interactions, supramolecular chemistry, molecular materials, colloids, nano particles, thin films.

### Intended learning outcomes

The students gain fundamental knowlegde in the relationships of physical, chemical and technological properties of materials and their structure. They understand the significance of various inter- and intramolecular interactions and how they determine the properties of molecular materials. They learn how to familiarize themselves with a scientific topic including a literature search, and how to give a presentation including discussion and feedback.

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of weekly contact hours</th>
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<tbody>
<tr>
<td>V</td>
<td>(3) + S (1)</td>
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### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

(a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)] as well as talk (approx. 30 minutes), weighted 3:1

Language of assessment: German and/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>
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<tbody>
<tr>
<td>Chemically and bio-inspired Nanotechnology for Material Synthesis</td>
<td>08-FU-NT-152-m01</td>
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</tbody>
</table>

**Contents**

Synthesis methods and parameters in sol-gel chemistry as well as characterisation and application of created materials. Basic principles of bio-mineralisation, structure of biomaterials and introduction to bio-inspired materials synthesis.

**Intended learning outcomes**

The student possesses profound knowledge about sol-gel chemistry and biomineralisation.

**Courses**

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

V (4)

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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)

--
Material Science 2 (The Material Groups)  

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<td>Material Science 2 (The Material Groups)</td>
<td>08-FU-MaWi2-152-m01</td>
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<tbody>
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</table>

Contents


Intended learning outcomes

The students acquire fundamental knowledge about fabrication and properties of the major classes of materials and are able to apply this to scientific problems.

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

V (3) + Ü (1)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

Allocation of places

--

Additional information

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

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<th>Module title</th>
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<td>Polymer Chemistry 1 (Lecture and Practical Course)</td>
<td>03-FU-PM1-152-m01</td>
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<thead>
<tr>
<th>Module coordinator</th>
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<tbody>
<tr>
<td>holder of the Chair of Functional Materials in Medicine and Dentistry</td>
<td>Faculty of Medicine</td>
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</tbody>
</table>

### Contents

Basic methods of polymerisation: free radical polymerisations, polyadditions, ionic polymerisations, controlled radical polymerisations; characterisation of polymers and polymer analytics: gel permeation chromatography, endgroup analysis, mass spectrometry, rheology.

### Intended learning outcomes

The students acquire fundamentals of polymer chemistry and the related methods for their characterisation.

### Courses

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

- V (2) + P (2)

### 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) assessment and b) Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations)
- Assessment offered: Once a year, winter semester
- Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

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

--
## Nanoscale Materials

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<td>Nanoscale Materials</td>
<td>08-PCM3-161-m01</td>
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### Module coordinator
Lecturer of the seminar "Nanoskalige Materialien"

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

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</table>

### Duration
1 semester

### 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, nanoskalige Materialien zu charakterisieren. Er/Sie kann Analysenmethoden sowie Anwendungsgebiete nanoskaliger Materialien anführen.

### Courses
S (2) + Ü (1)
Module taught in: German or English

### Method of assessment
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)
Language of assessment: German and/or English creditable for bonus

### Allocation of places
--

### Additional information
--

### Referred to in LPO I
(examination regulations for teaching-degree programmes)
--
### Module title
Basics and applications of quantum chemistry

### Abbreviation
08-TCM2-161-m01

### Module coordinator
Module coordinator: lecturer of lecture "Computational Chemistry"

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

### ECTS
5

### Method of grading
numerical grade

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

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
The module introduces students to computational chemistry.

### Intended learning outcomes

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

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

<table>
<thead>
<tr>
<th>Type</th>
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<th>Language</th>
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<tr>
<td>Ü</td>
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</table>

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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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</thead>
<tbody>
<tr>
<td>Solid state chemistry and inorganic materials</td>
<td>08-ACM3-161-m01</td>
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</table>

**Module coordinator**

Lecturer of seminar "Festkörperchemie and Anorganische Materialien" (Solid State Chemistry and Inorganic Materials)

**Module offered by**

Institute of Inorganic Chemistry

<table>
<thead>
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</table>

**Duration**

1 semester graduate --

**Contents**

German contents available but not translated yet.

Das Modul führt in die Festkörperchemie ein. Schwerpunkte sind Struktur, chemische und physikalische Eigenschaften, Synthesemethoden sowie ausgewählte Materialien von Festkörpern.

**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 (3)

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
### Module title
Polymers II

### Abbreviation
03-FU-PM2-161-m01

### Module coordinator
holder of the Chair of Functional Materials in Medicine and Dentistry

### Module offered by
Faculty of Medicine

### ECTS
5

### Method of grading
numerical grade

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

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
Deepen polymer synthesis methods, special polymers (block copolymers, co-polymerization techniques, complex polymer architectures), biodegradable polymers, polypeptoides, natural polymers. We will discuss the application of the respective polymers: e.g., as biomaterials, for electrospinning, for the production of hydrogels and their behavior on surfaces.

### Intended learning outcomes
The student acquire advanced knowledge in polymer manufacturing, analysis and applications. This involves different synthetic routes with which the different molecules can be prepared from different starting materials. Students can estimate if and how fast a polymer degrades under given circumstances. Furthermore, they gain insight into the field of technically used polymers from nature. Each section also points to possible consequences / disadvantages that synthesis of the various polymers may have, thus drawing students' understanding to ethical concerns.

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

S (2) + Ü (1)

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)
Language of assessment: German and/or English

### Allocation of places
--

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

--
Homogeneous Catalysis
(25 or 30 ECTS credits)
Compulsory Courses
(20 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Organo- and Biocatalysis</td>
<td>08-HKM1-152-m01</td>
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</table>

<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecturer of the seminar &quot;Organo- and Biokatalyse&quot;</td>
<td>Faculty of Chemistry and Pharmacy</td>
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</table>

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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

S (3)

**Method of assessment**

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
### Module Catalogue for the Subject

#### Chemistry

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

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
</tr>
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<tbody>
<tr>
<td>Advanced organometallic chemistry and its application in homogeneous catalysis</td>
<td>08-HKM2-161-m01</td>
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<table>
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<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>lecturer of the seminar &quot;Spezielle Metallorganische Chemie and deren Anwendung in der Homogenkatalyse&quot;</td>
<td>Institute of Inorganic Chemistry</td>
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**Duration**

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</table>

**Contents**

German contents available but not translated yet.

Das Modul bietet die Möglichkeit, Elementorganische Verbindungen der Übergangsmetalle mit homogenkatalytischen Anwendungen im Detail zu betrachten.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


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

<table>
<thead>
<tr>
<th>Type</th>
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Module taught in: German or English

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

**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>Practical course &quot;Homogeneous catalysis in Inorganic Chemistry&quot;</td>
<td>08-HKM3AC-161-m01</td>
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**Module coordinator**
- lecturer of the seminar "Spezielle Metallorganische Chemie and deren Anwendung in der Homogenkatalyse"

**Module offered by**
- Institute of Inorganic Chemistry

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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

- **P (6)**
  - Module taught in: German or English

**Method of assessment**

- report on practical course (approx. 10 pages) and talk (approx. 15 minutes)
- Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

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<table>
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<th>Module title</th>
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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)

P (6)
Module taught in: German or English

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

report on practical course (approx. 10 pages) and talk (approx. 15 minutes)
Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

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

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Compulsory Electives
(5 or 10 ECTS credits)
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<tr>
<th><strong>Module title</strong></th>
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<tr>
<td>Polymer Chemistry 1 (Lecture and Practical Course)</td>
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<td>holder of the Chair of Functional Materials in Medicine and Dentistry</td>
<td>Faculty of Medicine</td>
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<tr>
<th><strong>ECTS</strong></th>
<th><strong>Method of grading</strong></th>
<th><strong>Only after succ. compl. of module(s)</strong></th>
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<tr>
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<tr>
<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>
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</tbody>
</table>

**Contents**

Basic methods of polymerisation: free radical polymerisations, polyadditions, ionic polymerisations, controlled radical polymerisations; characterisation of polymers and polymer analytics: gel permeation chromatography, endgroup analysis, mass spectrometry, rheology.

**Intended learning outcomes**

The students acquire fundamentals of polymer chemistry and the related methods for their characterisation.

**Courses**

<table>
<thead>
<tr>
<th>type, number of weekly contact hours, language — if other than German</th>
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</thead>
<tbody>
<tr>
<td>V (2) + P (2)</td>
</tr>
</tbody>
</table>

**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) assessment and b) Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations) Assessment offered: Once a year, winter semester Language of assessment: German and/or English creditable for bonus

**Allocation of places**

--

**Additional information**

--

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

--
Module title | Abbreviation
---|---
Statistical Mechanics and Reaction Dynamics | 08-PCM2-161-m01

| Module coordinator | Module offered by |
---|---|
Lecturer of seminar "Chemische Dynamik" (Chemical Dynamics) | Institute of Physical and Theoretical Chemistry |

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

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

### Contents

The module deals with selected contents of statistical mechanics and reaction dynamics. It introduces the basic principles of statistical thermodynamics and conveys the transition state theory. Other topics are unimolecular and bimolecular reactions as well as charge and energy transfer.

### Intended learning outcomes

The students are familiar with selected contents of statistical mechanics and reaction dynamics. They know the basic principles of statistical thermodynamics and can apply them.

### Courses

| Type, number of weekly contact hours, language | If other than German |
---|---|
S (2) + Ü (1) | |

Module taught in: German or English

### Method of assessment

| Type, scope, language | If other than German, examination offered | If not every semester, information on whether module is creditable for bonus |
---|---|---|
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes) | | |
Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title | Basics and applications of quantum chemistry
---|---
Abbreviation | 08-TCM2-161-m01

Module coordinator | Module offered by
lecturer of lecture "Computational Chemistry" | Institute of Physical and Theoretical Chemistry

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

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

Contents
The module introduces students to computational chemistry.

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

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

Courses (type, number of weekly contact hours, language — if other than German)
S (2) + Ü (2)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

Allocation of places
--

Additional information
--

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

**Modern Synthetic Methods**

### Abbreviation

08-OCM-SYNT-161-m01

### Module coordinator

Lecturer of the seminar

### Module offered by

Institute of Organic Chemistry

### ECTS

5

### Method of grading

Numerical grade

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

--

### Duration

1 semester

### Module level

Graduate

### Other prerequisites

--

### Contents

German contents available but not translated yet.

Das Modul behandelt moderne stereoselektive Synthesemethoden. Schwerpunkt sind ausgewählte Totalsynthesen, Organometallchemie und Katalyse.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, anspruchsvolle chemische Synthesen stereoselektiv zu planen sowie stereoisch zu analysieren. Er/Sie kann Totalsynthesen erklären. Er/Sie kann Aspekte der Organometallchemie und Katalyse in der Synthesechemie darstellen.

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

S (2) + Ü (1)

Module taught in: German or English

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

### Allocation of places

--

### Additional information

--

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

--
Module title | Abbreviation
---|---
Advanced transition metal chemistry | 08-HKM4-161-m01

Module coordinator | Module offered by
I lecturer of the seminar "Spezielle Übergangsmetallchemie" | Institute of Inorganic Chemistry

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

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

Contents

German contents available but not translated yet.

Das Modul vertieft Inhalte der Stoffchemie von Übergangsmetallen und der Koordinationschemie. Es führt in die Bioanorganische Chemie ein und zeigt aktuelle Entwicklungen in der Übergangsmetallchemie auf.

Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, Übergangsmetalle und Koordinationsverbindungen auf fachlich hohem Niveau zu erklären. Er/Sie kann grundlegende Inhalte der Bioorganischen Chemie darstellen.

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

S (3)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

Allocation of places

--

Additional information

--

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

--
Medicinal Chemistry
(25 or 30 ECTS credits)
Compulsory Courses
(10 ECTS credits)
<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tr>
<td>Practical course medicinal chemistry</td>
<td>08-MCM1-161-m01</td>
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<th>Module offered by</th>
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<tbody>
<tr>
<td>Lecturers Pharmazeutische Chemie (Pharmaceutical Chemistry)</td>
<td>Institute of Pharmacy and Food Chemistry</td>
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<tr>
<td>1 semester</td>
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</table>

Contents

German contents available but not translated yet.

Ausgewählte Methoden und Themen der Medizinischen Chemie (Synthese, Testung, Analytik, Theorie, Pharmakokinetik).

Intended learning outcomes

German intended learning outcomes available but not translated yet.

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

Courses

<table>
<thead>
<tr>
<th>(type, number of weekly contact hours, language — if other than German)</th>
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<tr>
<td>P (10)</td>
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<tr>
<td>Module taught in: German or English</td>
</tr>
</tbody>
</table>

Method of assessment

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical assignments (2 to 4 random examinations) as well as report (30 to 50 pages)

Language of assessment: German and/or English

Allocation of places

--

Additional information

--

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

--
Compulsory Electives
(15 or 20 ECTS credits)
Module title | Abbreviation
---|---
Drug design | 08-MCM3-152-m01

Module coordinator | Module offered by
Pharmazeutische Chemie (Pharmaceutical Chemistry) | Institute of Pharmacy and Food Chemistry

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

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

Contents
German contents available but not translated yet.


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

Courses (type, number of weekly contact hours, language — if other than German)
S (2) + Ü (1)
Module taught in: German or English

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 with discussion (approx. 30 minutes)
Language of assessment: German and/or English

Allocation of places
20 places. 4 places for students of the Master's degree programme Chemie (Chemistry): Places will be allocated according to the same number of subject semesters; students who have chosen Medizinische Chemie (Medicinal Chemistry) as their focus will be given preferential consideration; among applicants with the same number of subject semesters, places will be allocated by lot.; 6 places for students of the Master's degree programme Biochemie (Biochemistry): Places will be allocated according to the number of subject semesters; among applicants with the same number of subject semesters, places will be allocated by lot; a waiting list will be maintained and places re-allocated by lot as they become available.

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
## Module title
Clinical-analytical Chemistry

## Abbreviation
08-PH-KAC-152-m01

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

## Module offered by
Institute of Pharmacy and Food Chemistry

## ECTS
5

## Method of grading
Numerical grade

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

## Duration
1 semester

## Module level
Undergraduate

## Other prerequisites
-

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

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

Der/Die Studierende verfügt über Fortgeschrittenkenntnisse der Molekularbiologie.

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

V (3)

### 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. 120 minutes)
Language of assessment: German and/or English

### Allocation of places
-

### Additional information
-

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

---
Module title | Practical course of clinical-analytical Chemistry
---|---
Abbreviation | 08-PH-KACP-152-m01

Module coordinator | Lecturer of lecture "Klinisch-analytische Chemie" (Clinical and Analytical Chemistry)
Module offered by | Institute of Pharmacy and Food Chemistry

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

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

Contents

German contents available but not translated yet.
Das Modul behandelt praktische Themen der Klinischen Chemie sowie der Klinischen Diagnostik und die dazugehörigen analytischen Methoden.

Intended learning outcomes

German intended learning outcomes available but not translated yet.
Der/Die Studierende verfügt über Kenntnisse der Klinisch-analytischen Chemie und kann die Inhalte in praktischen Versuchen anwenden.

Courses (type, number of weekly contact hours, language — if other than German)
P (5)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations).
Language of assessment: German and/or English

Allocation of places

Additional information

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

--
# Bioinorganic Chemistry

**Module title**: Bioinorganic Chemistry  
**Abbreviation**: 08-ACM2-161-m01

<table>
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<tr>
<th>Duration</th>
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<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

**Module coordinator**: lecturer of seminar "Anorganische Aspekte der Biochemie und Medizinischen Chemie" (Inorganic Aspects of Biochemistry and Medicinal Chemistry)  
**Module offered by**: Institute of Inorganic Chemistry

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

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

**Contents**

German contents available but not translated yet.

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

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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

S (3)  
Module taught in: German or English

**Method of assessment**

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

--

**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>Modern Synthetic Methods</td>
<td>08-OCM-SYNT-161-m01</td>
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<tbody>
<tr>
<td>lecturer of the seminar</td>
<td>Institute of Organic Chemistry</td>
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**Contents**

German contents available but not translated yet.

Das Modul behandelt moderne stereoselektive Synthesemethoden. Schwerpunkt sind ausgewählte Totalsynthesen, Organometallchemie und Katalyse.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, anspruchsvolle chemische Synthesen stereoselektiv zu planen sowie stereoisomisch zu analysieren. Er/Sie kann Totalsynthesen erklären. Er/Sie kann Aspekte der Organometallchemie und Katalyse in der Syntheseechemie darstellen.

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

S (2) + Ü (1)

Module taught in: German or English

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

--

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

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Modern Aspects of Natural Product Chemistry and Biological Chemistry</td>
<td>08-OCM-NAT-161-m01</td>
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<table>
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<th>Module coordinator</th>
<th>Module offered by</th>
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</thead>
<tbody>
<tr>
<td>lecturer of the seminar</td>
<td>Institute of Organic Chemistry</td>
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<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

Das Modul behandelt spezielle Themen der Naturstoffchemie und Biologischer Chemie.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

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

**Courses**

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

S (3)

Module taught in: German or English

**Method of assessment**

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

MA Chemie: unbegrenzt, Ma Biochemie: 20 places. Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.

**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>
<th>ECTS</th>
<th>Method of grading</th>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular Biology for advanced students</td>
<td>08-BC-MOLMC-161-m01</td>
<td>5</td>
<td>numerical grade</td>
<td>1 semester</td>
<td>graduate</td>
<td>--</td>
<td>The module covers specific topics of molecular physiology and functional biochemistry in lectures and exercises.</td>
</tr>
</tbody>
</table>

**Intended learning outcomes**

After attending the module events, students have solid knowledge in molecular biology.

**Courses**

(V (2) + Ü (1))

**Method of assessment**

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

--
**Module title**  
Practical course "Structural Biology" for advanced students  

**Abbreviation**  
o8-BC-VPSB-161-m01

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

**Module offered by**  
Chair of Biochemistry

<table>
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<td>10</td>
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<td>graduate</td>
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</table>

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

**ECTS**  
o8-BC-MOLP

**Duration**  
graduate

**Contents**

German contents available but not translated yet.

Das Modul beschäftigt sich mit der Frage nach Klonierung und Expression von Proteinkonstrukten für die Kristallisation. Es vermittelt die Grundlagen und Techniken der Kristallisation und Kristalloptimierung sowie der Kristallografischen Datensammlung.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Der/Die Studierende erwirbt ein Grundverständnis für die Herangehensweise bei der Wahl von Proteinkonstrukten für die Kristallisation. Er/Sie beherrscht nach Besuch der Modulveranstaltungen die grundlegenden Fertigkeiten und Techniken der Proteinkristallisation und Datensammlung/-verarbeitung.

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

P (10)

**Method of assessment**  
type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus

Log (approx. 20 pages) and talk (approx. 15 minutes)  
Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

--

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

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## Module: Pharmaceutical/Medicinal Chemistry 1

<table>
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<td>Institute of Pharmacy and Food Chemistry</td>
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<tbody>
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<td>1 semester</td>
<td>graduate</td>
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</table>

## Contents

German contents available but not translated yet.

Chemie der Arzneistoffe, gegliedert nach Indikationsgebieten; Prinzipien der Arzneistoffentwicklung, Strategien der Wirkstofffindung; Molekulare Wirkmechanismen; pharmakologische Grundlagen der behandelten Arzneistoffe; Analytik der Arzneistoffe; Synthese der Arzneistoffe; Biotransformation, Pharmakokinetik einzelner Arzneistoffe; Geschichte der Arzneistoffentwicklung an Beispielen.

## Intended learning outcomes

The students acquire knowledge of pharmaceutic/medical chemistry and the according methods of their characterization.

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

V (3)

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

## Allocation of places

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## Additional information

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

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<table>
<thead>
<tr>
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<td>08-MCM2b-161-m01</td>
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<th>Module offered by</th>
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<td>Lecturers Pharmazieutische Chemie (Pharmaceutical Chemistry)</td>
<td>Institute of Pharmacy and Food Chemistry</td>
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### Contents

German contents available but not translated yet.

Chemie der Arzneistoffe, gegliedert nach Indikationsgebieten; Prinzipien der Arzneistoffentwicklung, Strategien der Wirkstofffindung; Struktur-Wirkungs-Beziehungen; Molekulare Wirkmechanismen; pharmakologische Grundlagen der behandelten Arzneistoffe; Analytik der Arzneistoffe; Synthese der Arzneistoffe; Biotransformation, Pharmakokinetik einzelner Arzneistoffe; Geschichte der Arzneistoffentwicklung an Beispielen.

### Intended learning outcomes

The students acquire knowledge of pharmaceutic/medical chemistry and the according methods of their characterization.

### Courses

<table>
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Language of assessment: German and/or English

### Allocation of places

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### Additional information

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

--
### Module title
Mass-Spectrometry and Proteomics

### Abbreviation
08-MBC-MSP-161-m01

### Module coordinator
holder of the Chair of Biochemistry

### Module offered by
Chair of Biochemistry

### ECTS
5

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

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
The module "Mass Spectrometry and Proteomics" includes a lecture, which teaches the basics of mass spectrometry of biomolecules. There, inter alia, the gentle ionization ESI and MALDI, and the functional principles of different mass analyzers such as TOF and Orbitrap are discussed. The lecture part gives an introduction to the mass spectrometric fragmentation techniques CID and ETD, its separation techniques for peptides and proteins, as well as to the analysis of mass spectrometric data (protein databases, FDR, GO terms, etc.). Furthermore, an overview of the field of quantitative proteomics is given; especially different methods of quantification by stable isotopes (SILAC, N15-Labeling, iTRAQ, etc.) will be discussed. Finally, the lecture gives insights in the mass spectrometric analysis of posttranslational modifications. The seminar part of the module imparts fundamentals of mass spectrometric analysis data. To this end, the participants will be introduced to different software packages and then work independently on exemplary data sets to find solutions for different tasks. In the practical part of the module, participants will isolate a protein complex from yeast by affinity purification. This complex is separated by 1D-SDS-PAGE and proteolytically cleaved in the gel. The peptides obtained are analyzed by nanoLC-MS / MS. Finally data analysis is conducted with the aim of identifying specific interaction partners and post-translational modifications.

### Intended learning outcomes
On a broad basis, participants are taught the theoretical foundations of mass spectrometric analysis of proteins and proteomes. In the seminar, participants learn how to use data analysis software in the field of proteomics. In the practical part of the module, participants will learn affinity purification of a protein complex from yeast by affinity purification. This complex is separated by 1D-SDS-PAGE and proteolytically cleaved in the gel. The peptides obtained are analyzed by nanoLC-MS / MS. Finally data analysis is conducted with the aim of identifying specific interaction partners and post-translational modifications.

### Courses
(type, number of weekly contact hours, language — if other than German)
V (2) + S (1) + P (2)
Module taught in: German or English

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 45 to 90 minutes) or b) log (20 to 30 pages) or c) oral examination of one candidate each (20 to 30 minutes) or d) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate) or e) presentation (20 to 40 minutes)
Assessment offered: Once a year, winter semester
Language of assessment: German and/or English

### Allocation of places
67 places.

### Additional information
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)
--
Supramolecular Chemistry
(25 or 30 ECTS credits)
Compulsory Courses
(10 ECTS credits)
Module title: Supramolecular Chemistry (Basics)
Abbreviation: 08-SCM1-152-m01

Module coordinator: Lecturer of lecture "Organischen Chemie"
Module offered by: Faculty of Chemistry and Pharmacy
ECTS: 5

Method of grading: Only after successfully completed module(s)
Numerical grade: --
Duration: 1 semester
Module level: Graduate
Other prerequisites: --

Contents:
German contents available but not translated yet.


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


Courses (type, number of weekly contact hours, language — if other than German)
S (3)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes)
Language of assessment: German and/or English

Allocation of places: --

Additional information: --

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
### Module Catalogue for the Subject Chemistry

Master's with 1 major, 120 ECTS credits

**Module title**

Supramolecular Chemistry (Practical Course)

**Abbreviation**

08-SCM2-161-m01

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<td>Faculty of Chemistry and Pharmacy</td>
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**Contents**

German contents available but not translated yet.

Das Modul bietet den Studierenden die Möglichkeit, grundlegende Versuche zum Thema Supramolekularer Chemie praktisch durchzuführen. Es werden Wirt-Gast-Komplexe, Farbstoffaggregate und Nanopartikel synthetisiert sowie mit spezifischen Analysemethoden charakterisiert.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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

P (6)

Module taught in: German or English

**Method of assessment**

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

Vortestate/Nachtestate (pre and post-experiment examination talks approx. 15 minutes each, log approx. 5 to 10 pages each) and assessment of practical performance (2 to 4 random examinations)

Language of assessment: German and/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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Compulsory Electives

(15 or 20 ECTS credits)
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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


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

| S (3) |

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, nanoskalige Materialien zu charakterisieren. Er/Sie kann Analysenmethoden sowie Anwendungsgebiete nanoskaliger Materialien anführen.

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

S (2) + Ü (1)

Module taught in: German or English

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

a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes)

Language of assessment: German and/or English
creditable for bonus

**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>lecturer of the seminar &quot;Physikalische Chemie Supramolekularer Strukturen&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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</table>

### Contents

German contents available but not translated yet.

Das Modul betrachtet im Detail die grundlegenden Wechselwirkungen zwischen Molekülen. Es werden Bildung und physikalische-chemische Eigenschaften von Aggregaten besprochen. Wichtige Anwendungen supramolekularer Chemie werden thematisiert.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses

(2) + Ü (1)

Module taught in: German or English

### Method of assessment

(a) written examination (approx. 90 minutes) or (b) oral examination of one candidate each (approx. 20 minutes) or (c) talk (approx. 30 minutes)

Language of assessment: German and/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>graduate</td>
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</table>

**Contents**

German contents available but not translated yet.

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

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses**

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

S 3

Module taught in: German or English

**Method of assessment**

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

a) written examination (approx. 45 to 90 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (15 to 30 minutes per candidate)

Language of assessment: German and/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>Basics and applications of quantum chemistry</td>
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**Module coordinator**

lecturer of lecture "Computational Chemistry"

**Module offered by**

Institute of Physical and Theoretical Chemistry

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</table>

**Duration**

graduate

**Contents**

The module introduces students to computational chemistry.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

**Courses**

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

S (2) + Ü (2)

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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)

--
Organic Functional Materials

Module Coordinator:
Lecturer of the seminar "Organische Funktionsmaterialien"

Module offered by:
Institute of Organic Chemistry

ECTS: 5

Method of Grading:
Only after successful completion of module(s)

Duration: 1 semester

Module Level: Graduate

Other Prerequisites:
--

Contents:
German contents available but not translated yet.

Das Modul behandelt spezifische Themen der organischen Funktionsmaterialien. Schwerpunkte sind grundlegende physikalische Effekte, organische Festkörper, Anwendung organischer Funktionsmaterialien und organische und metallorganische Polymerchemie

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


Courses:
S (3)

Method of Assessment:
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

Allocation of Places:
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Additional Information:
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Referred to in LPO I (examination regulations for teaching-degree programmes)

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### Contents

The module deepens special synthetic and analytical methods of Supramolecular Chemistry. The students work independently in the laboratory, record their research results and present them in a talk.

### Intended learning outcomes

The students are able to carry out demanding synthetic and analytical methods in the field of Supramolecular Chemistry experimentally and to evaluate the results. He/She can present their research results in a talk.

### Courses

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### Method of assessment

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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)

--
Theoretical Chemistry

(25 or 30 ECTS credits)
Compulsory Courses

(15 ECTS credits)
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<td>1 semester</td>
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**Contents**

The module introduces students to computational chemistry.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden sind in der Lage, die theoretischen Grundlagen der Computational Chemistry zu erklären sowie Methoden der Computational Chemistry anzuwenden.

**Courses**

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

S (2) + Ü (2)

**Method of assessment**

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

--

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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### Numerical Methods and Programming

**Module title**  
Numerical Methods and Programming

**Abbreviation**  
08-TCM3-161-m01

**Module coordinator**  
lecturer of lecture "Programmieren in Theoretischer Chemie"

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

**ECTS**  
5

**Method of grading**  
numerical grade

**Duration**  
1 semester

**Module level**  
graduate

**Other prerequisites**  
--

### Contents

German contents available but not translated yet.

Das Modul führt in Grundlagen der Programmierung in der Theoretischen Chemie ein und zeigt Anwendungsgebiete auf.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden können eine in der Theoretischen Chemie verwendete Programmiersprache theoretisch erklären und praktisch anwenden sowie Anwendungsmöglichkeiten anführen.

### Courses

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

S (2) + Ü (2)

### Method of assessment

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

a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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>Quantum Dynamics</td>
<td>08-TCM4-161-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
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</thead>
<tbody>
<tr>
<td>lecturer of lecture &quot;Quantendynamik&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<thead>
<tr>
<th>ECTS</th>
<th>Method of grading</th>
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<table>
<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</tbody>
</table>

### Contents

Time-dependent Schrödinger equation, propagators, time-dependent perturbation theory, adiabatic theorem, diabatic and adiabatic states, non-adiabatic dynamics, mixed quantum-classical dynamics.

### Intended Learning Outcomes

The students possess knowledge about the time-dependent description of the nuclear and electronic dynamics in molecules. Their insight into the methods and the numerical realizations allow them to carry out applications in the field of theoretical chemistry.

### Courses

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

| S (2) + Ü (2) |

### Method of assessment

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

- a) written examination (approx. 90 to 180 minutes) or
- b) oral examination of one candidate each (20 to 30 minutes) or
- c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or
- d) log (approx. 20 pages) or
- e) presentation (approx. 30 minutes)

Language of assessment: German and/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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Compulsory Electives

(10 or 15 ECTS credits)
Module title | Abbreviation
--- | ---
Drug design | 08-MCM3-152-m01

Module coordinator | Module offered by
Pharmazeutische Chemie (Pharmaceutical Chemistry) | Institute of Pharmacy and Food Chemistry

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

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

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

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

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

S (2) + Ü (1)

Module taught in: German or English

**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 with discussion (approx. 30 minutes)

Language of assessment: German and/or English

**Allocation of places**

20 places. 4 places for students of the Master’s degree programme Chemie (Chemistry): Places will be allocated according to the same number of subject semesters; students who have chosen Medizinische Chemie (Medicinal Chemistry) as their focus will be given preferential consideration; among applicants with the same number of subject semesters, places will be allocated by lot.; 6 places for students of the Master’s degree programme Biochemie (Biochemistry): Places will be allocated according to the number of subject semesters; among applicants with the same number of subject semesters, places will be allocated by lot; a waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

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

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<td>08-TCM1-161-m01</td>
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<td>lecturer of lecture &quot;Theoretische Chemie&quot;</td>
<td>Institute of Physical and Theoretical Chemistry</td>
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<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</tbody>
</table>

**Contents**
The module introduces students to theoretical chemistry.

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

Die Studierenden können mathematische und physikalische Grundlagen quantenchemischer und quantendynamischer Ansätze der Theoretischen Chemie darstellen.

**Courses** (type, number of weekly contact hours, language — if other than German)
S (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (20 to 30 minutes) or c) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes)

Language of assessment: German and/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

**Theoretical Chemistry - Project course quantum chemistry**

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<td>08-TCAP1-161-m01</td>
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### Module coordinator

head of the research group offering the module

### Module offered by

Institute of Physical and Theoretical Chemistry

### ECTS

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### Duration

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<tbody>
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</table>

### Contents

The module offers students the opportunity to work in a group of the Institute for Theoretical Chemistry as well as to become familiar with typical working methods. The main focus of the practical course is Quantum Chemistry.

### Intended learning outcomes

The students are able to apply typical working methods of the Theoretical Chemistry, especially in the area of Quantum Chemistry. He/She can explain specific contents of Quantum Chemistry.

### 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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<tr>
<td>presentation (approx. 30 minutes) Language of assessment: German and/or English</td>
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</table>
### Module title

**Theoretical Chemistry - Project course quantum dynamics**

### Abbreviation

08-TCAP2-161-m01

### Module coordinator

head of the research group offering the module

### Module offered by

Institute of Physical and Theoretical Chemistry

### ECTS

5

### Method of grading

(not) successfully completed

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

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### Duration

Module level

graduate

### Other prerequisites

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### Contents

The module offers students the opportunity to work in a group of the Institute for Theoretical Chemistry as well as to become familiar with typical working methods. The main focus of the practical course is Quantum Dynamics.

### Intended learning outcomes

The students are able to apply typical working methods of the Theoretical Chemistry, especially in the area of Quantum Dynamics. He/She can explain specific contents of Quantum Dynamics.

### Courses

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<th>Type</th>
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### Method of assessment

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Presentation (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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Thesis

(30 ECTS credits)
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<th>Module offered by</th>
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<tbody>
<tr>
<td>degree programme coordinator Chemie (Chemistry)</td>
<td>Faculty of Chemistry and Pharmacy</td>
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<th>Module level</th>
<th>Other prerequisites</th>
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<tbody>
<tr>
<td></td>
<td>graduate</td>
<td>Where applicable, specific modules as specified by supervisor.</td>
</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 to module.

**Method of assessment**

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

Master's thesis (approx. 60 to 80 pages)

Language of assessment: German and/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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