



# Module Catalogue

for the Subject

## Didactics in Chemistry (Middle School)

as Didaktikfach

with the degree "Erste Staatsprüfung für das Lehramt für  
Sonderpädagogik"

Examination regulations version: 2013  
Responsible: Faculty of Chemistry and Pharmacy

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## The subject is divided into

section / sub-section	ECTS credits	starting page
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Subject-specific Extra Skills		15
Thesis	10	35

## 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:

**LASPO2009**

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

**25-Sep-2014 (2014-55)**

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

## Compulsory Courses

(20 ECTS credits)

Successful completion of modules worth 20 ECTS credits in each subject selected as Didaktikfach (subject studied with a focus on teaching methodology) is a prerequisite for admission to the Erste Staatsprüfung (First State Examination) in the subject Didaktiken einer Fächergruppe der Mittelschule (Didactics of a Group of Subjects of Mittelschule).

Module title		Abbreviation
Experiments in Chemical Education		o8-FD-ExUnt-092-m01
Module coordinator		Module offered by
holder of the Professorship of Didactics of Chemistry		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	undergraduate	--
<b>Contents</b>		
This module equips students with experimental skills and teaches them how to incorporate experiments into their lessons.		
<b>Intended learning outcomes</b>		
Students have learned some essential experiments for the chemistry classroom in Grundschule and Hauptschule schools and have developed the ability to safely perform them. They have developed the ability to design their own experiments, tailor them to their teaching goals and to incorporate them into their lessons.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> <li>o8-FD-ExUnt-1-092: Ü (no information on SWS (weekly contact hours) and course language available)</li> <li>o8-FD-ExUnt-2-092: S (no information on SWS (weekly contact hours) and course language available)</li> </ul>		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
<b>Assessment in module component o8-FD-ExUnt-1-092:</b> Experiments in Chemical Teaching at Primary and Secondary Public Schools <ul style="list-style-type: none"> <li>4 ECTS, Method of grading: numerical grade</li> <li>presentation with demonstration (approx. 30 minutes)</li> <li>Language of assessment: German or English</li> </ul> <b>Assessment in module component o8-FD-ExUnt-2-092:</b> Planning of Teaching Units <ul style="list-style-type: none"> <li>1 ECTS, Method of grading: numerical grade</li> <li>presentation (approx. 20 minutes)</li> <li>Language of assessment: German or English</li> </ul>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 36 (1) 7. Didaktik der Grundschule Chemie § 38 (1) 1. Didaktik der Hauptschule Chemie § 38 (1) 1. Didaktik der Mittelschule Chemie § 42 Chemie Fachdidaktik		
LA Sonderpädagogik Didactics in Chemistry (Middle School) (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Lehr- amt Sonderpädagogik (Mittelschule-Didaktikfach) Chemie - 2013	page 6 / 35

### Module appears in

First state examination for the teaching degree Grundschule Chemistry (2009)  
 First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009)  
 First state examination for the teaching degree Hauptschule Chemistry (2009)  
 First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009)  
 First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009)  
 First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013)  
 First state examination for the teaching degree Mittelschule Chemistry (2013)  
 First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)

Module title			Abbreviation
Chemistry Education: Educational Theory and Models of Teaching Concepts			o8-FD-Ch-BM-Did-092-mo1
Module coordinator		Module offered by	
holder of the Professorship of Didactics of Chemistry		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	undergraduate	--	
Contents			
This module introduces students to the fundamentals of chemistry didactics.			
Intended learning outcomes			
Students have become familiar with theories and models for teaching chemistry. They are able to select and prepare teaching materials that support their teaching goals and know how to use them in the chemistry classroom.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"><li>o8-FD-Einf-1-092: V (no information on SWS (weekly contact hours) and course language available)</li><li>o8-FD-Ch-BM-Did-2-092: S (no information on SWS (weekly contact hours) and course language available)</li></ul>			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
<b>Assessment in module component o8-FD-Einf-1-092:</b> Introduction in Chemistry Education <ul style="list-style-type: none"><li>3 ECTS, Method of grading: numerical grade</li><li>written examination (approx. 90 minutes)</li><li>Language of assessment: German or English</li></ul>			
<b>Assessment in module component o8-FD-Ch-BM-Did-2-092:</b> Generation and Utilization of learning Aids <ul style="list-style-type: none"><li>2 ECTS, Method of grading: (not) successfully completed</li><li>presentation (approx. 20 minutes)</li><li>Language of assessment: German or English</li></ul>			
Allocation of places			
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Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
§ 36 (1) 7. Didaktik der Grundschule Chemie § 38 (1) 1. Didaktik der Hauptschule Chemie § 38 (1) 1. Didaktik der Mittelschule Chemie § 42 Chemie Fachdidaktik § 62 (1) 6. Chemie Didaktik			



### Module appears in

First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009)  
First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009)  
First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009)  
First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013)  
First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)

Module title		Abbreviation
Concepts of Teaching Chemistry		o8-FD-SchulUms-Did-092-m01
Module coordinator		Module offered by
holder of the Professorship of Didactics of Chemistry		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	undergraduate	--
Contents		
Topics covered in the chemistry curricula for Hauptschule schools and ways to teach them.		
Intended learning outcomes		
Students have become familiar with the contents, objectives and framework conditions of chemistry lessons. They have developed the ability to plan and teach lessons in the Hauptschule chemistry classroom on the basis of the relevant curricula.		
Courses (type, number of weekly contact hours, language — if other than German)		
<p>This module comprises 2 module components. Information on courses will be listed separately for each module component.</p> <ul style="list-style-type: none"> <li>o8-FD-SchulUms-1-092: S (no information on SWS (weekly contact hours) and course language available)</li> <li>o8-FD-SchulUms-Did-2-092: S (no information on SWS (weekly contact hours) and course language available)</li> </ul>		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.</p> <p><b>Assessment in module component o8-FD-SchulUms-1-092:</b> Technical Contents and Practicabilities in Schools</p> <ul style="list-style-type: none"> <li>3 ECTS, Method of grading: numerical grade</li> <li>Testat (exam, approx. 20 minutes)</li> <li>Language of assessment: German or English</li> </ul> <p><b>Assessment in module component o8-FD-SchulUms-Did-2-092:</b> Theoretical Basics of School-Chemistry</p> <ul style="list-style-type: none"> <li>2 ECTS, Method of grading: numerical grade</li> <li>written examination (approx. 45 minutes)</li> <li>Language of assessment: German or English</li> </ul>		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
<p>§ 36 (1) 7. Didaktik der Grundschule Chemie          § 38 (1) 1. Didaktik der Hauptschule Chemie          § 38 (1) 1. Didaktik der Mittelschule Chemie          § 42 Chemie Fachdidaktik</p>		

### Module appears in

First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009)  
First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009)  
First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009)  
First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013)  
First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)

Module title			Abbreviation
Social Forms in Chemistry Learning and Extracurricular Sites			o8-FD-HS-Did-092-m01
Module coordinator		Module offered by	
holder of the Professorship of Didactics of Chemistry		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	undergraduate	--	
Contents			
This module discusses modes of interaction in the chemistry classroom as well as out-of-classroom learning environments.			
Intended learning outcomes			
Students are able to select and use appropriate modes of interaction in the chemistry classroom. They are able to use out-of-classroom activities to enhance the learning experience of pupils.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"><li>o8-FD-HS-Did-1-092: S (no information on SWS (weekly contact hours) and course language available)</li><li>o8-FD-HS-Did-2-092: Ü (no information on SWS (weekly contact hours) and course language available)</li></ul>			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
<b>Assessment in module component o8-FD-HS-Did-1-092: Social Forms in Chemistry Learning at Comprehensive Schools</b> <ul style="list-style-type: none"><li>3 ECTS, Method of grading: numerical grade</li><li>presentation (approx. 45 minutes)</li><li>Language of assessment: German or English</li></ul> <b>Assessment in module component o8-FD-HS-Did-2-092: Extracurricular Sites</b> <ul style="list-style-type: none"><li>2 ECTS, Method of grading: (not) successfully completed</li><li>presentation of a field trip to out-of-classroom learning environments (approx. 45 minutes)</li><li>Language of assessment: German or English</li></ul>			
Allocation of places			
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Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
§ 38 (1) 1. Didaktik der Hauptschule Chemie § 38 (1) 1. Didaktik der Mittelschule Chemie			
Module appears in			
First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009)			
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First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)

## **Freier Bereich (general as well as subject-specific electives)**

( ECTS credits)

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

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

## Subject-specific Extra Skills

( ECTS credits)

(Freier Bereich (general as well as subject-specific electives) -- subject specific)

Module title		Abbreviation
Physical Chemistry (teaching degree for secondary schools)		o8-PC-GHR-102-m01
Module coordinator		Module offered by
lecturer of lecture "Thermodynamik, Kinetik, Elektrochemie für Studierende der Biologie, Lebensmittelchemie and des Lehramtes Chemie GHR"		Institute of Physical and Theoretical Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
4	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
This module discusses the fundamental principles of thermodynamics, kinetics and electrochemistry.		
<b>Intended learning outcomes</b>		
Students have become familiar with the fundamental principles of thermodynamics, kinetics and electrochemistry. They are able to understand and explain fundamental processes in nature and engineering.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 42 (1) 1. Chemie "Allgemeine und Anorganische Chemie" und "Physikalische und Analytische Chemie"		
<b>Module appears in</b>		
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009) First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013) First state examination for the teaching degree Mittelschule Chemistry (2013) First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)		



Module title			Abbreviation
Inorganic Chemistry of the Elements (teaching degree for secondary schools)			o8-AC2-LAGY-102-m01
Module coordinator		Module offered by	
lecturer of lecture "Festkörperchemie" (Solid State Chemistry)		Institute of Inorganic Chemistry	
ECTS	Method of grading	Only after succ. compl. of module(s)	
3	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
This module equips students with an advanced knowledge of metals, alloys and saline compounds. It focuses on their structures and properties, special material classes, reactivity and technical processes.			
Intended learning outcomes			
Students are able to describe the structure and properties of metals, alloys and saline compounds in an appropriate manner. They are able to systemise them and characterise their structure and reactivity.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German or English			
Allocation of places			
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Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
§ 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"			
Module appears in			
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009) First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009) First state examination for the teaching degree Gymnasium Chemistry (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013) First state examination for the teaching degree Mittelschule Chemistry (2013) First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)			

Module title		Abbreviation
<b>Organic Chemistry - laboratory course (teaching degree for secondary schools)</b>		o8-OC-Prakt-GHR-o92-m01
Module coordinator		Module offered by
lecturers Organische Chemie (Organic Chemistry)		Institute of Organic 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		
This module gives students the opportunity to apply in practice the knowledge they have gained through the related lecture(s). After a safety briefing, the students autonomously conduct experiments in the laboratory. In addition to those experiments, students will be expected to take oral tests and write lab reports to demonstrate their knowledge. The course focuses on the safe handling of hazardous substances, simple experimental unit operations of organic chemistry, simple to multi-level syntheses and the analysis of the products.		
Intended learning outcomes		
Students know how to safely handle hazardous substances. They are able to conduct simple experimental operations of organic chemistry. They are able to analyse the yield and purity of the products and identify possible error sources. They are able to connect the theoretical aspects covered in the lecture with practical experiments in the laboratory.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
pre/post-experiment examination talks (Vor-/Nachtestate, approx. 15 minutes each), log (approx. 5 to 10 pages) Assessment offered: once a year, summer semester Language of assessment: German or English		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 42 (1) 2. Chemie "Organische und Bioorganische Chemie"		
Module appears in		
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009) First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013) First state examination for the teaching degree Mittelschule Chemistry (2013)		
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Module title		Abbreviation
Basic Mathematics (teaching degree)		o8-PC-VKM-LA-102-m01
Module coordinator		Module offered by
lecturer of block course "Mathematik" (Mathematics)		Institute of Physical and Theoretical Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
2	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
This module provides an introduction to mathematical concepts and methods used in physical/theoretical chemistry. It trains students in those methods with the help of examples taken from thermodynamics and kinetics.		
<b>Intended learning outcomes</b>		
Students have been trained in mathematical methods. They are able to apply those methods to problems in chemistry.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
exercises (4 work sheets) Language of assessment: German or English		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
--		
<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009) First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009) First state examination for the teaching degree Gymnasium Chemistry (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013) First state examination for the teaching degree Mittelschule Chemistry (2013) First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)		

Module title		Abbreviation
<b>Exercises in Experimental Presentation</b>		o8-Ch-GH-ÜiV-092-mo1
Module coordinator		Module offered by
lecturers of the three lectures offered in this module		Faculty of Chemistry and Pharmacy
ECTS	Method of grading	Only after succ. compl. of module(s)
6	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
Students will design, prepare and deliver presentations on a range of topics in chemistry. Presentations will include live demonstrations.		
<b>Intended learning outcomes</b>		
Students are able to deliver a detailed and scientifically correct presentation on a given topic that is tailored to the specific needs of their audience. They are able to select experiments on the topic in question that support a particular teaching goal as well as to plan and safely perform them. Students will be expected to apply both their chemistry knowledge and skills and their teaching skills.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
This module comprises 3 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> <li>o8-Ch-LA-ÜiV-1-092: Ü (no information on SWS (weekly contact hours) and course language available)</li> <li>o8-Ch-LA-ÜiV-2-092: Ü (no information on SWS (weekly contact hours) and course language available)</li> <li>o8-Ch-GH-ÜiV-3-092: Ü (no information on SWS (weekly contact hours) and course language available)</li> </ul>		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
<b>Assessment in module component o8-Ch-LA-ÜiV-1-092:</b> Exercises in Experimental Presentation (Inorganic Chemistry) <ul style="list-style-type: none"> <li>2 ECTS, Method of grading: (not) successfully completed</li> <li>talk with demonstrations (approx. 45 minutes)</li> <li>Assessment offered: once a year, winter semester</li> <li>Language of assessment: German or English</li> </ul>		
<b>Assessment in module component o8-Ch-LA-ÜiV-2-092:</b> Exercises in Experimental Presentation (Organic Chemistry) <ul style="list-style-type: none"> <li>2 ECTS, Method of grading: (not) successfully completed</li> <li>talk with demonstrations (approx. 45 minutes)</li> <li>Assessment offered: once a year, winter semester</li> <li>Language of assessment: German or English</li> </ul>		
<b>Assessment in module component o8-Ch-GH-ÜiV-3-092:</b> Exercises in Experimental Presentation (Physical Chemistry) for Primary School and Secondary Public School Teachers <ul style="list-style-type: none"> <li>2 ECTS, Method of grading: (not) successfully completed</li> <li>talk with demonstrations (approx. 45 minutes)</li> <li>Assessment offered: once a year, winter semester</li> <li>Language of assessment: German or English</li> </ul>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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LA Sonderpädagogik Didactics in Chemistry (Middle School) (2013)		page 21 / 35

<b>Workload</b>
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<b>Teaching cycle</b>
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)
§ 42 (1) 3. Chemie "Übungen im Vortragen mit Demonstrationen"
<b>Module appears in</b>
<p>First state examination for the teaching degree Grundschule Chemistry (2009)</p> <p>First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009)</p> <p>First state examination for the teaching degree Hauptschule Chemistry (2009)</p> <p>First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009)</p> <p>First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009)</p> <p>First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013)</p> <p>First state examination for the teaching degree Mittelschule Chemistry (2013)</p> <p>First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)</p>

Module title		Abbreviation
<b>Organic Chemistry 1 (teaching degree for secondary schools)</b>		o8-OC1-GHR-092-m01
Module coordinator		Module offered by
holder of the Professorship of Organic Chemistry		Institute of Organic Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
6	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).
Contents		
This module provides students with an overview of the fundamental principles of organic chemistry. It examines the bonding situation of carbon and introduces students to the nomenclature of simple and moderately complex organic compounds. The module also discusses the fundamental principles of stereochemistry, substitution, addition and elimination reactions as well as synthesis planning.		
Intended learning outcomes		
Students know important categories of substances in organic chemistry. They are able to use different systems of nomenclature to determine simple substance names. Students are able to analyse the stereochemistry of molecules. They are able to describe and formulate some of the most important reactions in organic chemistry. For that purpose, they can analyse and categorise the characteristic reaction conditions and can use them for simple syntheses.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German or English		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 42 (1) 2. Chemie "Organische und Bioorganische Chemie"		
Module appears in		
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009) First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009)		
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First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009)
First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013)
First state examination for the teaching degree Mittelschule Chemistry (2013)
First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)



Module title		Abbreviation
<b>Organic Chemistry 2 (teaching degree for secondary schools)</b>		o8-OC2-GHR-o92-m01
Module coordinator		Module offered by
holder of the Chair of Physically Organic Chemistry		Institute of Organic Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
7	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).
Contents		
This module introduces students to the rules of aromaticity and discusses specific reactions of aromatics. Using the example of carbonyl compounds, it extends the students' knowledge of substitution, elimination and addition reactions to complex reaction mechanisms. The course also focuses on oxidation and reduction reactions as well as rearrangement.		
Intended learning outcomes		
Students have become familiar with the criteria for aromaticity. They can analyse the varying reactivity of carbonyl compounds. They are able to describe specific reactions of carbonyls and aromatics. For that purpose, they can plan and formulate multi-stage syntheses with complex reaction mechanisms and can transfer them to unknown reactions.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German or English		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 42 (1) 2. Chemie "Organische und Bioorganische Chemie"		
Module appears in		
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009) First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009)		

First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009)
First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013)
First state examination for the teaching degree Mittelschule Chemistry (2013)
First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)

Module title		Abbreviation
Biochemistry (teaching degree for secondary schools)		o8-BC-GHR-092-m01
Module coordinator		Module offered by
holder of the Chair of Biochemistry		Chair of Biochemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
4	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).
<b>Contents</b>		
Comprising lectures and exercises, this module acquaints students with the fundamental principles of biochemistry.		
<b>Intended learning outcomes</b>		
Students have become familiar with the fundamental principles of biochemistry. They are able to describe the key biochemical processes in cellular systems.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German or English		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 42 (1) 2. Chemie "Organische und Bioorganische Chemie"		
<b>Module appears in</b>		
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009) First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013) First state examination for the teaching degree Mittelschule Chemistry (2013)		

First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)

Module title		Abbreviation
Guidance in Self-reliant Scientific Work		o8-FD-WPF-WA-092-m01
Module coordinator		Module offered by
holder of the Professorship of Didactics of Chemistry		Institute of Inorganic Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
2	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
This module will teach students how to independently research and write on selected topics in chemistry didactics.		
<b>Intended learning outcomes</b>		
Students are able to independently research and write on selected topics in chemistry didactics. They are able to provide an account of the current state of research as well as to develop ideas to advance the discipline.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
presentation (approx. 30 minutes) Language of assessment: German or English		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009) First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009) First state examination for the teaching degree Gymnasium Chemistry (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013) First state examination for the teaching degree Mittelschule Chemistry (2013) First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)		

Module title		Abbreviation
Preparation of Exams (Primary and Secondary Public Scholl Teachers)		o8-FD-WPF-PVGSHS-o92-m01
Module coordinator		Module offered by
holder of the Professorship of Didactics of Chemistry		Institute of Inorganic Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
2	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
Students will solve selected questions that were asked in the state examination in previous years.		
<b>Intended learning outcomes</b>		
Students are able to solve selected questions that were asked in the state examination in previous years.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 30 minutes)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009) First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013) First state examination for the teaching degree Mittelschule Chemistry (2013) First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)		

Module title		Abbreviation
Extracurricular Sites		o8-FD-WPF-LLL-092-mo1
Module coordinator		Module offered by
holder of the Professorship of Didactics of Chemistry		Institute of Inorganic Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
4	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
This module discusses the opportunities and limitations of out-of-classroom learning in chemistry.		
<b>Intended learning outcomes</b>		
Students are able to plan chemistry lessons that include out-of-classroom learning activities and, in particular, activities in school labs that support their teaching goals. They are able to put those plans into practice and guide pupils as they perform experiments.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> <li>o8-FD-WPF-LLL-1-092: S (no information on SWS (weekly contact hours) and course language available)</li> <li>o8-FD-WPF-LLL-2-092: P (no information on SWS (weekly contact hours) and course language available)</li> </ul>		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
<b>Assessment in module component o8-FD-WPF-LLL-1-092: Opportunities of Extracurricular Sites</b> <ul style="list-style-type: none"> <li>2 ECTS, Method of grading: (not) successfully completed</li> <li>presentation of a project (approx. 30 minutes)</li> <li>Language of assessment: German or English</li> </ul> <b>Assessment in module component o8-FD-WPF-LLL-2-092: School Lab</b> <ul style="list-style-type: none"> <li>2 ECTS, Method of grading: (not) successfully completed</li> <li>successful supervision of experiments in learn-teach-lab</li> <li>Language of assessment: German or English</li> </ul>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009)		
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First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009)  
 First state examination for the teaching degree Realschule Chemistry (2009)  
 First state examination for the teaching degree Gymnasium Chemistry (2009)  
 First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009)  
 First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013)  
 First state examination for the teaching degree Mittelschule Chemistry (2013)  
 First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)



Module title			Abbreviation
Inorganic Chemistry 1 (teaching degree)			o8-AC1-LA-102-m01
Module coordinator		Module offered by	
lecturer of lecture "Experimentalchemie" (Experimental Chemistry)		Institute of Inorganic Chemistry	
ECTS	Method of grading	Only after succ. compl. of module(s)	
20	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
This module provides students with an overview of the fundamental principles of chemistry. It focuses on particles, metals, acid-base reactions, the periodic table, chemical equilibrium and complexometry. In addition, the module introduces fundamental models of chemistry and principles of inorganic chemistry. It includes practical exercises based on the lecture on experimental chemistry and its extension. After a safety briefing, the students autonomously conduct experiments in the laboratory. The course focuses on laboratory safety, simple lab techniques, the synthesis of simple substances and analyses of unknown substances. In addition, students have the opportunity to advance their laboratory knowledge.			
Intended learning outcomes			
Students are able to explain the principles of the periodic table and to extract information from it. They are able to explain basic models of the structure of matter. They have developed the ability to use the language of chemical formulas to describe chemical reactions and to interpret them by identifying the type of reaction. Students are able to describe the main quantitative and qualitative analytical methods and their application areas. They are able to identify fundamental problems in chemistry and perform experiments to solve them. They have developed the ability to perform the necessary stoichiometric calculations and describe the chemical processes in an appropriate manner, both in written and oral form.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 3 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"><li>o8-AC1-1-102: V + V + Ü (no information on SWS (weekly contact hours) and course language available)</li><li>o8-AC1-LA-2-102: P (no information on SWS (weekly contact hours) and course language available)</li><li>o8-AC1-LA-3-102: V (no information on SWS (weekly contact hours) and course language available)</li></ul>			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
Assessment in module component o8-AC1-1-102: Principles of Inorganic Chemistry Principles of Inorganic Chemistry Principles of Inorganic Chemistry <ul style="list-style-type: none"><li>10 ECTS, Method of grading: numerical grade</li><li>a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)</li><li>Language of assessment: German or English</li><li>Other prerequisites: Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).</li></ul>			
Assessment in module component o8-AC1-LA-2-102: Inorganic and Analytical Chemistry (lab) (teaching degree) <ul style="list-style-type: none"><li>7 ECTS, Method of grading: (not) successfully completed</li></ul>			
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<ul style="list-style-type: none"> <li>• pre/post-experiment examination talks (Vor-/Nachtestate, approx. 15 minutes each), log (approx. 5 to 10 pages)</li> <li>• Assessment offered: once a year, summer semester</li> <li>• Language of assessment: German or English</li> </ul> <p><b>Assessment in module component 08-AC1-LA-3-102:</b> Inorganic Chemistry 1 (accompanying lecture) (teaching degree)</p> <ul style="list-style-type: none"> <li>• 3 ECTS, Method of grading: numerical grade</li> <li>• a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)</li> <li>• Language of assessment: German or English</li> </ul>
<b>Allocation of places</b>
--
<b>Additional information</b>
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<b>Workload</b>
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<b>Teaching cycle</b>
--
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)
§ 42 (1) 1. Chemie "Allgemeine und Anorganische Chemie" und "Physikalische und Analytische Chemie"
§ 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"
<b>Module appears in</b>
<p>First state examination for the teaching degree Grundschule Chemistry (2009)</p> <p>First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009)</p> <p>First state examination for the teaching degree Hauptschule Chemistry (2009)</p> <p>First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009)</p> <p>First state examination for the teaching degree Realschule Chemistry (2009)</p> <p>First state examination for the teaching degree Gymnasium Chemistry (2009)</p> <p>First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Secondary School) (2009)</p> <p>First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013)</p> <p>First state examination for the teaching degree Mittelschule Chemistry (2013)</p> <p>First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)</p>

## Thesis

(10 ECTS credits)

Preparation of a written Hausarbeit (thesis) in accordance with the provisions of Section 29 LPO I (examination regulations for teaching-degree programmes) is a prerequisite for teaching degree students to be admitted to the Erste Staatsprüfung (First State Examination). In accordance with the provisions of Section 29 LPO I, students studying for a teaching degree Mittelschule may write this thesis in the subject Didaktik einer Fächergruppe der Mittelschule (Didactics of a Group of Subjects of Mittelschule), in the subject they selected as Unterrichtsfach (subject studied with a focus on the scientific discipline) or in the subject Erziehungswissenschaften (Educational Science). Pursuant to Section 29 Subsection 1 Sentence 2 LPO I, students may also choose to write an interdisciplinary thesis.