

# 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: 2014 Responsible: Faculty of Chemistry and Pharmacy



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# The subject is divided into

section / sub-section	ECTS credits	starting page	
Compulsory Electives	90	12	
Compulsory Electives Focuses	75	13	
Inorganic Chemistry	25	14	
Compulsory Courses	20	15	
Compulsory Electives	5	18	
Organic Chemistry	25	22	
Compulsory Courses	15	23	
Compulsory Electives	10	27	
Physical Chemistry	25	34	
Compulsory Courses	10	35	
Compulsory Electives	15	38	
Biochemistry	25	46	
Compulsory Courses	15	47	
Compulsory Electives	10	50	
Functional Materials	25	61	
Compulsory Courses	20	62	
Compulsory Electives	5	67	
Homogeneous Catalysis	25	77	
Compulsory Courses	20	78	
Compulsory Electives	5	83	
Medicinal Chemistry	25	90	
Compulsory Courses	25	91	
Supramolecular Chemistry	25	96	
Compulsory Courses	10	97	
Compulsory Electives	15	101	
Theoretical Chemistry	25	109	
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Organic Chemistry	25	192	
Compulsory Courses	15	193	
Compulsory Electives		197	
Physical Chemistry	25	205	
Compulsory Courses	20	206	
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Compulsory Courses	20	241
Compulsory Electives		246
Homogeneous Catalysis	25	257
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Medicinal Chemistry	25	270
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Compulsory Electives		273
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### **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:  $\mathbf{E} = \text{field trip}$ ,  $\mathbf{K} = \text{colloquium}$ ,  $\mathbf{O} = \text{conversatorium}$ ,  $\mathbf{P} = \text{placement/lab course}$ ,  $\mathbf{R} = \text{project}$ ,  $\mathbf{S} = \text{seminar}$ ,  $\mathbf{T} = \text{tutorial}$ ,  $\ddot{\mathbf{U}} = \text{exercise}$ ,  $\mathbf{V} = \text{lecture}$ 

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:

#### ASP02009

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

#### 19-Feb-2014 (2014-1)

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**

(90 ECTS credits)



# **Compulsory Electives Focuses**

(75 ECTS credits)

Students must choose three focuses with 25 ECTS credits each.



# **Inorganic Chemistry**

(25 ECTS credits)



# **Compulsory Courses**

(20 ECTS credits)



Modul	e title				Abbreviation
Advanced Inorganic Chemistry				08-ACM1-141-m01	
Modul	e coord	linator		Module offered by	I.
Manag	ging Dir	ector of the Institute of In	organic Chemistry	Institute of Inorgan	ic Chemistry
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
2 seme	ester	graduate			
Conter	nts				
specia	l comp		elements (MGEs), bo		metal chemistry. It focuses on MGEs and MGE compounds, the
Intend	ed lear	ning outcomes			
the cho	emical rdinatio		etals and analyse th	e structure as well a	roup elements. They can describe s chemical and physical aspects
S + S (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	lable)
		sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether
30 min or d) lo and le	nutes) o og (app ngth of	or c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes,	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type
Allocation of places					
Additio	onal inf	ormation			
Worklo	oad				
Teachi	ing cycl	e			

Module appears in

Master's degree (1 major) Chemistry (2014)

 $\textbf{Referred to in LPO I} \ \ (\text{exa}\underline{\text{mination regulations for teaching-degree programmes})}$ 



Module title				Abbreviation	
Inorganic Chemistry practical course for advanced			08-ACPM-132-m01		
Modul	e coord	linator		Module offered by	
focus point coordinator "Inorganic Chemistry'		nemistry" Institute of Inorganic Chemistry		ic Chemistry	
ECTS Method of grading Only after succ. compl. of		pl. of module(s)			
10	(not)	successfully completed			
Duratio	ıration Module level Other prerequisites				
1 seme	ster	graduate			
Contents					
This module gives students the opportunity to enhance their skills in advanced synthesis and analytical methods in inorganic chemistry. The focus will be on working under inert atmospheres, purification methods, spectral analysis and crystallography. Students will be expected to conduct their work in the lab independently, write					

#### **Intended learning outcomes**

Students are able to use advanced synthesis and analytical methods in inorganic chemistry in the lab and to interpret their findings. They are able to write a lab report documenting their findings and deliver a presentation.

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

a lab report documenting their findings and deliver a presentation.

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)

practical work with lab report (approx. 20 pages) and talk (approx. 15 minutes) Language of assessment: German or English

#### **Allocation of places**

--

#### **Additional information**

Additional information on module duration: block placement with a duration of a minimum of 40 working days.

### Workload

--

### **Teaching cycle**

--

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

--

#### Module appears in

Master's degree (1 major) Chemistry (2013)



# **Compulsory Electives**

(5 ECTS credits)



Module title					Abbreviation	
Bioanorganic Chemistry 08-ACM2-141-m01			08-ACM2-141-m01			
Module	e coord	linator		Module offered by		
and Me	edizinis	minar "Anorganische Aspo schen Chemie" (Inorganic edicinal Chemistry)		Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its					
	ds of B				chemistry (BIC). It discusses the ns of BIC in the fields of diagnosis	
Intende	ed lear	ning outcomes				
		able to describe the princ us enzymes and describe			xplain the structure and effects medicine.	
Course	S (type,	number of weekly contact hours, l	anguage — if other than Ger	rman)		
S (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and ler	utes) o g (app ngth of	or c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Allocat	ion of	places				
Additio	nal inf	ormation				
Workload						
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
	-					
Module						
Master	's degr	ee (1 major) Chemistry (2	014)			



Module	e title	·		Abbreviation		
Solid s	tate ch	emistry and inorganic m	aterials		08-ACM3-141-m01	
Module	e coord	inator		Module offered by		
		ninar "Festkörperchemie Solid State Chemistry and		Institute of Inorgan	ic Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
		rovides an introduction t nthesis methods and sel			structure, chemical and physical	
Intend	ed lear	ning outcomes				
					plain methods for solid-state the corresponding solids.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
S (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	<u>e</u> )	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and ler	utes) o g (appi igth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	ars in				
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation	
Advanc lysis	ed org	anometallic chemistry ar	omogeneous cata-	08-HKM2-141-m01		
Module	coord	inator		Module offered by		
		seminar "Spezielle Meta wendung in der Homogen		Institute of Inorgan	ic Chemistry	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
This mo	odule e	xamines elementary orga	anic compounds of tra	ansition metals with	homogeneous catalytic applica-	
Intende	ed lear	ning outcomes				
		,		•	nentary organic compounds. They neous catalysis reactions.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
S (no ir	format	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
		<b>sessment</b> (type, scope, langua ole for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and ler	utes) o g (appi igth of	r c) oral examination in g	roups (groups of 2: a ntation (approx. 30 n ourse.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Allocat	ion of p	places				
Additio	nal inf	ormation				
Worklo	Workload					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	ars in				
Master	's degr	ee (1 major) Chemistry (2	014)			



# **Organic Chemistry**

(25 ECTS credits)



## **Compulsory Courses**

(15 ECTS credits)



Modul	e title			Abbreviation			
Moder	n Synth	netic Methods		08-OCM-SYNT-141-m01			
Modul	e coord	inator		Module offered by			
lecture	er of the	seminar	_	Institute of Organic	Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ester	graduate					
Conter	nts						
		liscusses modern stereogenistry and catalysis.	selective synthesis m	ethods. It focuses or	n selected total syntheses, orga-		
Intend	ed lear	ning outcomes					
They c					stereochemically analyse them. chemistry and catalysis in synthe-		
Course	<b>es</b> (type, r	number of weekly contact hours,	anguage — if other than Ger	rman)			
S + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)		
		sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English							
Allocation of places							
Additional information							
<del></del>							
Workload							
Teachi	ng cycl	e					

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

\_\_\_\_

Module appears in



					I		
Module title					Abbreviation		
Advan	ced NM	R- and Mass Spectromet	ry		08-OCM-NMRMS-141-m01		
Modul	e coord	inator		Module offered by			
lab co	urse su	pervisor		Institute of Organic	Chemistry		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)			
5	nume	rical grade					
Durati	on	Module level	Other prerequisites				
1 seme	ester	graduate					
Conter	nts						
sights	into the		the two measuring to	echniques and inclu	pectrometry. It offers deeper indes exercises that give students meter.		
Intend	ed lear	ning outcomes					
		able to discuss NMR and to experiment with both			n degree of expertise in the field.		
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)			
P (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge $-$ if other than German, $\epsilon$	examination offered — if no	ot every semester, information on whether		
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English							
Alloca	tion of p	olaces					
Additional information							
Workload							
Teachi	Teaching cycle						

Module appears in

Master's degree (1 major) Chemistry (2014)

 $\textbf{Referred to in LPO I} \ \ (\text{examination regulations for teaching-degree programmes})$ 



Module	Module title Abbreviation						
Advanc	Advanced Research Project 08-0CM-AKP1-122-mo1						
Module	e coord	inator		Module offered by			
head o	f the re	search group offering the	module	Institute of Organic	Chemistry		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)			
5	(not)	successfully completed					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
		ives students the opport f Organic Chemistry and			the research groups based at ytical methods.		
Intend	ed learı	ning outcomes					
		able to describe and use well as to describe theor	•	s and analytical met	hods typically used by the rese-		
Course	<b>S</b> (type, n	number of weekly contact hours, l	anguage — if other than Ger	rman)			
P (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	2)		
		sessment (type, scope, langua le for bonus)	ge $-$ if other than German, $\epsilon$	examination offered — if no	ot every semester, information on whether		
		5 minutes) and log (appr ssessment: German or Er					
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
	_						
Worklo	ad						
Teachi	ng cycl	e					
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						
	_	ee (1 major) Chemistry (2					
Master	Master's degree (1 major) Chemistry (2014)						

# **Compulsory Electives**

(10 ECTS credits)



Module	Module title Abbreviation					
Modern Aspects of Natural Product Chemistry and Biological Chemistry 08-OCM-NAT-141-m						
Module	e coordinator		Module offered by	•		
lecture	r of the seminar		Institute of Organic	Chemistry		
ECTS	Method of grading	Only after succ. con	npl. of module(s)			
5	numerical grade					
Duratio	n Module level	Other prerequisites				
1 seme	ster graduate					
Conten	ts					
This mo	odule discusses advanced topic	s in natural product o	chemistry and biolog	gical chemistry.		
Intende	ed learning outcomes					
Studen	ts are able to discuss advanced	topics in natural pro	duct chemistry and	biological chemistry.		
Course	<b>S</b> (type, number of weekly contact hours,	language — if other than Ger	rman)			
S (no ir	nformation on SWS (weekly cont	tact hours) and cours	e language available	e)		
	d of assessment (type, scope, langua s creditable for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and len		roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of places					
Chemis	stry Master's: no restrictions. Bio	ochemistry Master's:	20 places. Places wi	ill be allocated by lot.		
Additio	nal information					
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appears in					
Master	's degree (1 major) Chemistry (2	014)				



Wi	ÜRZBU	JRG 1	5 (2. 7. 7. 8)	33 0 2 1	Master's with 1 major, 120 ECTS credits		
Module title Abbreviation							
Organi	Organic Functional Materials				08-OCM-FM-141-m01		
Module	coord	inator		Module offered	i by		
lecture	r of the	seminar "Organische Fu	nktionsmaterialien"	Institute of Org	anic Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s	)		
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites	i			
1 seme	ster	graduate					
Conten	ts						
sical effects in organic molecular and polymeric semiconductors as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in non-linear optics.  Intended learning outcomes  The students are able to explain fundamental (photo)physical processes in organic semiconductors. He/She can explain the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlinear optics.							
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)			
S (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language avai	lable)		
<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) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, 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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 $\textbf{Referred to in LPO I} \ \ (\text{examination regulations for teaching-degree programmes})$ 

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### Module appears in



Organo- and Biocatalysis       Module coordinator     Module offered by       lecturer of the seminar "Organo- and Biokatalyse"     Institute of Organic Chemistry       ECTS     Method of grading     Only after succ. compl. of module(s)       5     numerical grade					
lecturer of the seminar "Organo- and Biokatalyse"  Institute of Organic Chemistry  ECTS Method of grading Only after succ. compl. of module(s)					
ECTS Method of grading Only after succ. compl. of module(s)					
5 numerical grade					
Duration Module level Other prerequisites					
1 semester graduate					
Contents					
processes. Organocatalysis: enantioselective implementation, principles, green chemistry, substance clas and application areas. Biocatalysis: effects of enzymes in view of different aspects, especially regarding or synthesis.					
Intended learning outcomes					
Students are able to categorise organocatalysts and explain their effects and areas of application. They ca scribe the structure and applications of enzymes in organic synthesis. They are able to mechanistically defend analyse the effects of enzymes.					
Courses (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 who module is creditable for bonus)	ether				
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 min or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the t and length of assessment prior to the course.  Language of assessment: German, English	utes)				
Allocation of places					
Additional information					
Workload					
<del></del>					
Teaching cycle					
Teaching cycle					

Module appears in



Module title					Abbreviation	
Supramolecular Chemistry (Basics)					08-SCM1-102-m01	
Module coordinator				Module offered	Module offered by	
lecture	r of lec	ture "Organischen C	hemie"	Faculty of Chem	Faculty of Chemistry and Pharmacy	
ECTS	Meth	od of grading	Only after succ.	compl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisi	Other prerequisites		
1 semester graduate						
Conten	its					
			•	•	ecular chemistry. It focuses on inte	

actions between molecules, molecular recognition by receptors, complexes, supramolecular polymers, coordination polymers and networks, liquid crystals, self-assembly in aqueous media, synthetic ion channels and modern applications of supramolecular chemistry.

#### **Intended learning outcomes**

Students are able to explain interactions between molecules demonstrating a high degree of expertise in the field as well as to describe the formation, structure and polymers of coordination compounds. They are able to describe the self-assembly of polymers in aqueous media as well as to identify the characteristics of synthetic ion channels. They can name modern applications of supramolecular chemistry.

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

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

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

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

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#### Module appears in

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Functional Materials (2012)



Module title					Abbreviation		
Bioorganic Chemistry 08-SCM3-141-m01							
Modu	le coord	inator		Module offered by			
lecture Chemi		ture "Bioorganische Che	mie" (Bioorganic	Institute of Organio	c Chemistry		
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)			
5	nume	rical grade					
Durati	ion	Module level	Other prerequisites	i			
1 sem	ester	graduate					
Conte	nts						
lar inte	eraction				medicine. It focuses on molecu- , new aspects of DNA, RNA, prote-		
Intend	led lear	ning outcomes					
can ex can de	kplain the escribe l es (type, r	ne molecular diversity of modern aspects of DNA, number of weekly contact hours,	biological systems. T RNA, proteins and ca <sub>language</sub> — if other than Ge	hey can characterise rbohydrates. <sup>rman)</sup>	es of bioorganic chemistry. They the fabrication of agents. They		
		tion on SWS (weekly con					
		<b>sessment</b> (type, scope, langua ble for bonus)	age — if other than German,	examination offered — if n	ot every semester, information on whether		
30 min or d) lo and le	nutes) o og (app ength of	r c) oral examination in g	groups (groups of 2: a entation (approx. 30 c course.	pprox. 30 minutes,	re candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type		
Alloca	tion of	olaces					
Additional information							
Workload							
Teaching cycle							
Referr	ed to in	LPO I (examination regulation	s for teaching-degree progra	ammes)			

Module appears in



Module title	Module title Abbreviation						
Computatio	nal Chemistry	08-TCM2-141-m01					
Module coo	dinator		Module offered by	•			
lecturer of le	cture "Computational Che	mistry"	Institute of Physica	l and Theoretical Chemistry			
ECTS Met	hod of grading	Only after succ. con	npl. of module(s)				
5 num	erical grade						
Duration	Module level	Other prerequisites					
1 semester	graduate						
Contents							
This module	introduces students to the	e fundamental princip	oles of computationa	al chemistry.			
Intended lea	rning outcomes						
Students are putational c	•	etical principles of co	mputational chemist	try and to apply methods in com-			
Courses (type	, number of weekly contact hours,	language — if other than Ger	rman)				
S + Ü (no inf	ormation on SWS (weekly	contact hours) and co	ourse language avail	able)			
Method of a		ge — if other than German,	examination offered — if no	ot every semester, information on whether			
30 minutes) or d) log (ap and length o	or c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type			
Allocation o	f places						
Additional i	nformation						
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module app	Module appears in						



# **Physical Chemistry**

(25 ECTS credits)



# **Compulsory Courses**

(10 ECTS credits)



Module	Module title Abbreviation					
Laser S	Spectro	oscopy			08-PCM1a-132-m01	
Module	e coord	linator		Module offered by	I.	
lecture copy)	r of se	minar "Laserspektroskopi	e" (Laser Spectros-	Institute of Physica	l and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade	-			
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate	-			
Conten	its					
		ntroduces students to the spectroscopy.	e fundamental princip	oles of laser spectros	scopy. It discusses absorption	
Intend	ed lear	ning outcomes				
		able to explain the compo ology. They are able to de			as well as the optical principles mission spectroscopy.	
Course	S (type,	number of weekly contact hours, l	anguage — if other than Ger	man)		
S + Ü (ı	no info	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		sessment (type, scope, langua	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
		nation (90 minutes) or or assessment: German or Er		inutes)		
Allocat	ion of	places				
Additio	nal inf	formation				
Worklo	ad					
Teachi	ng cyc	le				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
	Master's degree (1 major) Chemistry (2013)					
Master	's degi	ree (1 major) Chemistry (2	014)			



Module title					Abbreviation	
Advanced Physical Chemistry (Lab)					08-PCM1b-132-m01	
Module	coord	inator		Module offered by	Į.	
lecture copy)	r of ser	ninar "Laserspektroskopi	e" (Laser Spectros-	Institute of Physica	l and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
borato	y. Afte		idents autonomously	conduct experimen	ds in physical chemistry in the lats in the laboratory. Students will	
Intend	ed lear	ning outcomes				
		e developed a high level of to analyse the resulting r			ethods in physical chemistry.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)		
P (no ir	format	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
prox. 1	5 pages			xperiment exams) (a	approx. 15 minutes) and log (ap-	
Allocat	ion of <sub>I</sub>	olaces				
Additio	nal inf	ormation				
Additional information on module duration: block placement with a duration of a minimum of 20 working days.						
Workload						
<del></del>						
Teaching cycle						
<del></del>						
Referred to in LPO I (examination regulations for teaching-degree programmes)						



# **Compulsory Electives**

(15 ECTS credits)



		TAOX N	C MEON ABUILD	, , , , , , , ,		
Modul	e title				Abbreviation	
Chemical Dynamics					08-PCM2-102-m01	
Modul	e coord	inator		Module offered by	•	
lecture mics)	r of ser	ninar "Chemische Dynar	mik" (Chemical Dyna-	Institute of Physica	l and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	ıpl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts		`			
					ical kinetics and reaction dyna- cribing chemical reactions.	
Intend	ed lear	ning outcomes				
		able to discuss advance dels for the investigatio			dynamics. They can describe me-	
Course	<b>es</b> (type, r	number of weekly contact hours,	, language — if other than Ge	rman)		
S + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)	
Metho	d of ass	sessment (type, scope, langu	age — if other than German,	examination offered — if no	ot every semester, information on whether	
		le for bonus)				
		nation (90 minutes) or o ssessment: German or l		e candidate each (20	o minutes) or talk (30 minutes)	
Allocat	tion of <sub>I</sub>	olaces				
Additio	onal inf	ormation				
Worklo	ad					
	-					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2010)					

Master's degree (1 major) Chemistry (2014) Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)



Modul	e title		Abbreviation			
Nanos	cale Ma	aterials			08-PCM3-102-m01	
Module coordinator				Module offered by		
lecture	lecturer of the seminar "Nanoskalige Materialien"			Institute of Physica	Institute of Physical and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. co	ompl. of module(s)		
5	nume	rical grade				
Duratio	Duration Module level (		Other prerequisite	Other prerequisites		
1 seme	1 semester graduate					
Conten	Contents					

This module discusses advanced topics in nanoscale materials. It focuses on the structure, properties, fabrication, modern characterisation methods and application areas of nanoscale materials.

#### **Intended learning outcomes**

Students are able to characterise nanoscale materials. They are able to name analytical methods and application areas of nanoscale materials.

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

S + 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)

written examination (90 minutes) or oral examination of one candidate each (20 minutes) or talk (30 minutes) Language of assessment: German or English

#### Allocation of places

### **Additional information**

### Workload

#### **Teaching cycle**

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

#### Module appears in

Bachelor' degree (1 major) Nanostructure Technology (2010)

Bachelor' degree (1 major) Nanostructure Technology (2012)

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)

Master's degree (1 major) Functional Materials (2012)



Module title					Abbreviation	
Ultrafast spectroscopy and quantumcontrol				08-PCM4-141-m01		
Module	e coord	inator		Module offered by		
lecture Quante		seminar "Ultrakurzzeits¡ olle"	oektroskopie and	Institute of Physica	l and Theoretical Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate	Prior successful con ly recommended.	npletion of modules	o8-PCM1a and o8-PCM1b is high-	
Conten	ts					
		iscusses advanced topic ime-resolved laser spect			control. It focuses on ultrashort	
Intende	ed lear	ning outcomes				
plain th princip	ne theo les and		spectroscopy and na n control.	me experimental me	naracterise them. They can ex- ethods. They can describe the	
	-	rmation on SWS (weekly			able)	
Method	d of ass		- · · · · · · · · · · · · · · · · · · ·		ot every semester, information on whether	
(approx	x. 30 m			on of one candidate	each (approx. 20 minutes) or talk	
Allocat						
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
<del></del>						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
<del></del>						
Module	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation		
Physical chemistry of supramolecular assemblies					08-PCM5-141-m01		
Module	coord	inator		Module offered by			
lecture kularer		seminar "Physikalische uren"	Chemie Supramole-	Institute of Physica	l and Theoretical Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
		examines the basic intera of aggregates as well as			he formation and physical-cheministry.		
Intende	ed lear	ning outcomes					
in the f	ield. Tł		ation and physical-c		trating a high degree of expertise of aggregates. They can name mo-		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)			
S + Ü (r	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)		
Method	d of ass	sessment (type, scope, langua	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
		ole for bonus)					
(approx	x. 30 m	nation (approx. 90 minut inutes) Issessment: German, Eng		on of one candidate	each (approx. 20 minutes) or talk		
Allocat							
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
Master's degree (1 major) Chemistry (2014)							



Module title Abbreviation							
Physic	Physical Chemistry (Advanced Lab) 08-PCM6-132-mo1						
Module	e coord	inator		Module offered by			
lecture	rs Phys	ikalische Chemie (Physic	al Chemistry)	Institute of Physica	l and Theoretical Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed	o8-PCM1				
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its						
	_	rives students the opport f Physical Chemistry and	, .		f the research groups based at lytical methods.		
Intend	ed lear	ning outcomes					
		•			relevant physical chemistry resequestions in physical chemistry.		
Course	<b>S</b> (type, r	number of weekly contact hours,	anguage — if other than Ger	rman)			
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)		
		sessment (type, scope, langua ble for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
		(approx. 20 minutes) ssessment: German or E	nglish				
Allocat	ion of <sub>l</sub>	olaces					
Additio	nal inf	ormation					
Additio	nal inf	ormation on module dura	tion: block placemer	nt with a duration of	a minimum of 20 working days.		
Worklo	Workload						
Teaching cycle							
<del></del>							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
	<b></b>						

Master's degree (1 major) Chemistry (2013)



Module	Module title Abbreviation						
Theoretical Chemistry (Basics) 08-TCM1-141-mo1					08-TCM1-141-m01		
Module	coord	inator		Module offered by	·		
lecture	r of lect	ure "Theoretische Chemi	e"	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	ıpl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
This mo	odule ir	ntroduces students to the	fundamental princip	oles of theoretical ch	emistry.		
Intende	ed learr	ning outcomes					
		able to describe the math		al principles underly	ing the quantum chemical and		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		eessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and len	utes) o g (appr igth of a	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						



Module	Module title Abbreviation						
Compu	Computational Chemistry 08-TCM2-141-mo1						
Module	coord	inator		Module offered by	l.		
lecture	r of lect	ture "Computational Che	mistry"	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	numei	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
This mo	dule ir	ntroduces students to the	fundamental princip	oles of computationa	al chemistry.		
Intende	ed learr	ning outcomes					
Studen putatio			tical principles of co	mputational chemist	try and to apply methods in com-		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		<b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and len	utes) o g (appr igth of a	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	laces					
Additio	nal info	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						



# **Biochemistry**

(25 ECTS credits)

Students are highly recommended to consult with course advisory service prior to choosing this focus.



# **Compulsory Courses**

(15 ECTS credits)



Module	Module title Abbreviation						
Molecular Biology					08-BC-MOLM-141-m01		
Module	coord	inator		Module offered by			
holder	of the (	Chair of Biochemistry		Chair of Biochemist	try		
ECTS	Metho	od of grading	Only after succ. com	ipl. of module(s)			
5	numei	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
Compri tional b			his module discusse	s advanced topics ir	n molecular physiology and func-		
Intende	ed learr	ning outcomes					
Studen	ts have	e developed a sound kno	wledge of molecular	biology.			
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		<b>eessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether		
didate 30 min about t	each (a utes, gi he met	pprox. 20 minutes) or d)	oral examination in a nutes) or d) presenta sessment prior to the	groups of up to 3 car tion (approx. 30 min	or c) oral examination of one candidates (groups of 2: approx. nutes). Students will be informed		
Allocat							
Additio	nal info	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						



Module	Module title Abbreviation						
Molecu	ılar Bio	ology Lab			08-BC-MOLP-141-m01		
Module	e coord	linator		Module offered	by		
holder	of the	Chair of Biochemistry		Chair of Biocher	mistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
10	nume	rical grade					
Duratio	n	Module level	Other prerequisites	<b>,</b>			
1 seme	ster	undergraduate					
Conten	ts						
of mac	romole				t engineering and characterisation llysis of biochemical processes, and		
Intend	ed lear	ning outcomes					
Studen	ts have	e developed a knowled	ge of molecular biology	y and are able to a	apply it to practical experiments.		
Course	<b>S</b> (type, i	number of weekly contact hour	s, language — if other than Ge	rman)			
Ü (no ir	nforma	tion on SWS (weekly co	ntact hours) and cours	se language availa	able)		
<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) written examination (approx. 60 to 90 minutes) or b) log (approx. 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or e) presentation (approx. 30 minutes). Students will be informed							

about the method and length of the assessment prior to the course. Assessment offered: once a year, winter semester

Language of assessment: German, English

### Allocation of places

Biochemistry Bachelor's: 24 places. Chemistry Master's: 6 places.

### **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)

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### Module appears in



# **Compulsory Electives**

(10 ECTS credits)



Module title					Abbreviation
Practical course Molecular Machines for advanced students					08-BC-VPMM-141-m01
Modul	e coord	linator		Module offered by	I.
holder	of the	Chair of Biochemistry	1	Chair of Biochemis	try
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade	o8-BC-MOLP		
Duratio	on	Module level	Other prerequisites		
1 seme	ester	graduate			
Conter	nts				
lar bio	logy an	d biochemistry; cloni		expression and pur	d methods and topics in molecu- ification, RNA-protein and prote- nplexes.
Intend	ed lear	ning outcomes			
Studer work.	nts are a	able to explore a spe	cific research topic and d	eliver an oral preser	ntation on the results of their
Course	S (type, i	number of weekly contact ho	ours, language — if other than Ger	rman)	
P (no i	nforma	tion on SWS (weekly	contact hours) and cours	e language available	e)
		<b>sessment</b> (type, scope, lable for bonus)	anguage — if other than German,	examination offered — if no	ot every semester, information on whether
		o pages) and talk (ap assessment: German,			
Allocat	tion of	places			
Additio	onal inf	ormation			
Additional information on module duration: block placement with a duration of a minimum of 40 working days.					
Workload					
<del></del>					
Teaching cycle					

Master's degree (1 major) Chemistry (2014)

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



Modul	e title		Abbreviation				
Practio	Practical course Protein Degradation in Eukaryotes for advanced students 08-BC-VPPD-141-m01						
Modul	e coord	linator		Module offered b	у		
holder	of the	Chair of Biochemistry		Chair of Biochem	istry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
10	nume	rical grade	o8-BC-MOLP				
Durati	on	Module level	Other prerequisites	i			
1 seme	ester	graduate					
Conter	nts						
This m	-	gives students the oppor	tunity to explore a res	earch topic in the	field of protein degradation in eu-		
Intend	ed lear	ning outcomes					
Studer work.	nts are	able to explore a specifi	c research topic and d	eliver an oral pres	entation on the results of their		
Course	es (type,	number of weekly contact hours	, language — if other than Ge	rman)			
P (no i	nforma	tion on SWS (weekly cor	ntact hours) and cours	e language availal	ole)		
		sessment (type, scope, languole for bonus)	age — if other than German,	examination offered — if	not every semester, information on whether		
		o pages) and talk (appr assessment: German, En					
Alloca	tion of	places					
Additio	onal inf	ormation					
Additio	onal inf	ormation on module du	ation: block placeme	nt with a duration o	of a minimum of 40 working days.		
Workle	oad						
Teaching cycle							
			-				
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Modul	e appe	ars in					



Module title					Abbreviation		
Practical course RNA Biochemistry for advanced students					08-BC-VPRB-141-m01		
Modul	e coord	inator		Module offered by			
holder	of the (	Chair of Biochemistry		Chair of Biochemis	stry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
10	nume	rical grade	o8-BC-MOLP				
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conter	nts						
mes as	"mole		ory mechanisms of eu		eld of RNA biochemistry. Riboso- osynthesis. Gradient centrifugati-		
Intend	ed lear	ning outcomes					
trol wit manne	h the h	elp of different methods	as well as to present	their findings in an	eral and specific translation con- appropriate and understandable		
		number of weekly contact hours, l			`		
		ion on SWS (weekly cont					
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if n	ot every semester, information on whether		
		o pages) and talk (approssessment: German, Eng					
Allocat	tion of p	olaces					
Additio	onal inf	ormation					
Additional information on module duration: block placement with a duration of a minimum of 40 working days.							
Worklo	Workload						
Teachi	ng cycl	e					

Master's degree (1 major) Chemistry (2014)

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



Modul	e title				Abbreviation	
		se Structural Biology for	advanced students		o8-BC-VPSB-141-mo1	
Modul	e coord	inator		Module offered by		
holder	of the	Chair of Biochemistry		Chair of Biochemis	try	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade	o8-BC-MOLP			
Durati	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conte	nts					
the fur		ital principles and techni			stallisation. It teaches students sation as well as crystallographic	
Intend	ed lear	ning outcomes				
					constructs for crystallisation. Il as data collection and proces-	
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Ger	rman)		
P (no i	nforma	tion on SWS (weekly con	act hours) and cours	e language available	e)	
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
		o pages) and talk (appro ssessment: German, Eng				
Alloca	tion of <sub>I</sub>	places				
Additi	onal inf	ormation				
Additio	onal inf	ormation on module dura	ation: block placemer	nt with a duration of	a minimum of 40 working days.	
Workle	Workload					
Teaching cycle						
Referr	Referred to in LPO I (examination regulations for teaching-degree programmes)					
					-	



Module title					Abbreviation	
Bioanorganic Chemistry					08-ACM2-141-m01	
Module	e coord	inator		Module offered by		
and Me	edizinis	minar "Anorganische Aspo schen Chemie" (Inorganic edicinal Chemistry)		Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		,			
	ds of B				chemistry (BIC). It discusses the ns of BIC in the fields of diagnosis	
Intend	ed lear	ning outcomes				
		able to describe the princ us enzymes and describe			xplain the structure and effects medicine.	
Course	S (type, i	number of weekly contact hours, l	anguage — if other than Ger	rman)		
S (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
30 min or d) lo and ler	utes) o g (app ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of	places				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation	
Organo- and Biocatalysis					08-HKM1-141-m01	
Module coordinator Module offered by			<u>,                                      </u>			
lecture	r of the	e seminar "Organo- an	d Biokatalyse"	Institute of Organi	c Chemistry	
ECTS	Meth	od of grading	Only after succ. co	mpl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisite	S		
1 seme	ester	graduate				
Conter	ıts	,				
and ap	plicationsis.	on areas. Biocatalysis			en chemistry, substance classes ects, especially regarding organic	
		ning outcomes				
scribe	the stru		ns of enzymes in organi		areas of application. They can de- e able to mechanistically describe	
Course	S (type, i	number of weekly contact ho	urs, language — if other than G	erman)		
S (no i	nforma	tion on SWS (weekly o	contact hours) and cour	se language availab	le)	
		<b>sessment</b> (type, scope, la ble for bonus)	nguage — if other than German	, examination offered — if I	not every semester, information on whether	
30 min or d) lo and le	utes) o og (app ngth of	or c) oral examination	in groups (groups of 2: resentation (approx. 30 he course.	approx. 30 minutes,	ne candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	tion of	places				
Additio	onal inf	ormation				
Worklo	Workload					
Teachi	ng cycl	e				

Master's degree (1 major) Chemistry (2014)

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



Module title					Abbreviation	
Modern Aspects of Natural Product Chemistry and Biological Chemistry				al Chemistry	08-OCM-NAT-141-m01	
Module	coord	inator		Module offered by		
lecture	of the	seminar	_	Institute of Organic	Chemistry	
ECTS	Metho	od of grading	Only after succ. con	ıpl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
This mo	odule d	iscusses advanced topic	s in natural product o	themistry and biolog	rical chemistry.	
Intende	ed learn	ning outcomes				
Studen	ts are a	able to discuss advanced	topics in natural pro	duct chemistry and	biological chemistry.	
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)	
		sessment (type, scope, langua le for bonus)	ge — if other than German, (	examination offered — if no	ot every semester, information on whether	
30 minu or d) log and len	utes) o g (appr gth of a	r c) oral examination in g	roups (groups of 2: a ntation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of p	olaces				
Chemis	try Mas	ster's: no restrictions. Bio	ochemistry Master's:	20 places. Places wi	ill be allocated by lot.	
Additio	nal info	ormation	,			
Worklo	ad					
Teachir	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	Module appears in					
Master'	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation		
Princip	les of c	drug design			08-MCM3-132-m01		
Module	Module coordinator			Module offered by			
lecture mistry)		mazeutische Chemie (Pl	narmaceutical Che-	Institute of Pharma	cy and Food Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites	r			
1 seme	ster	graduate					
Conten	its						
cophor QSAR. gies, b	re mode Predict ioisoste	els, docking, virtual scre	ening, simulation met	thods, de novo desig	ure-based drug design, pharma- gn. Ligand-based drug design. ase examples, prodrug strate-		
Studen	its mas	ter the theoretical and e	xperimental methods	and aspects of drug	design.		
Course	<b>S</b> (type, r	number of weekly contact hours,	language — if other than Ge	rman)			
S + Ü (ı	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)		
		<b>sessment</b> (type, scope, langu ple for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether		
		with discussion (approx. ssessment: German or E					
Allocat	ion of p	places					
Additio	onal inf	ormation					
Worklo	ad						
Teachi	ng cycl	е					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
	e appea						
	Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2014)						



Modul	e title	-		Abbreviation			
Clinica	ıl and A	nalytical Chemistry			08-PH-KAC-092-m01		
Modul	e coord	inator		Module offered by	L		
		ture "Klinisch-analytische Chemistry)	e Chemie" (Clinical	Institute of Pharma	cy and Food Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Durati	on	Module level	Other prerequisites				
1 seme	ester	undergraduate					
Conte	nts						
This m	odule d	iscusses advanced topic	s in clinical analytica	l chemistry.			
Intend	ed learı	ning outcomes					
Studer	nts have	e developed an advanced	knowledge of molec	ular biology.			
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ge	man)			
V (no i	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)		
Metho	d of ass	sessment (type, scope, langua	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
		le for bonus)					
writter	examii	nation (120 minutes)	,				
Alloca	tion of p	olaces					
Additi	onal inf	ormation					
Workle	oad						
Teachi	ng cycl	<u></u> е					
Referr	ed to in	LPO I (examination regulation:	s for teaching-degree progra	immes)			
Modul	Module appears in						
Maste	Master's degree (1 major) Biochemistry (2012)						
	Master's degree (1 major) Chemistry (2013)						
	_	ee (1 major) Chemistry (2					
Maste	Master's degree (1 major) Chemistry (2014)						



Module	Module title Abbreviation						
Clinical and Analytical Chemistry (practical course)					08-PH-KACP-092-m01		
Module	coord	inator		Module offered by	I.		
		ture "Klinisch-analytische l Chemistry)	e Chemie" (Clinical	Institute of Pharma	cy and Food Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
This mo		overs practical topics in	clinical chemistry and	d clinical diagnostics	s as well as the related analytical		
Intende	ed lear	ning outcomes					
Studen ments.	ts have	e developed a knowledge	of clinical analytical	chemistry and are a	ble to apply it to practical experi-		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ge	rman)			
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
examin	ation t	alks (Testate, approx. 15	minutes each), log (a	pprox. 5 to 10 pages	5)		
Allocat	ion of	places					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	ımmes)			
	<del>-</del>						
Module	Module appears in						
		ee (1 major) Biochemistry					
	_	ee (1 major) Chemistry (2	= 1				
	_	ee (1 major) Chemistry (2	•				
Master	Master's degree (1 major) Chemistry (2014)						

# **Functional Materials**

(25 ECTS credits)



# **Compulsory Courses**

(20 ECTS credits)



Module collecturers socional Ma				08-FMM-MP-102-m01		
lecturers s ctional Ma ECTS M 5 (r						
ctional Ma ECTS M 5 (r		Module coordinator Module offered by				
5 (r		nsmaterialien (Fun-	Chair of Chemical T	echnology of Material Synthesis		
	Nethod of grading	Only after succ. con	ıpl. of module(s)			
Duration	not) successfully completed					
	Module level	Other prerequisites				
1 semeste	er graduate					
Contents						
Ten select	ted experiments in materials	science.				
Intended	learning outcomes					
Students	have developed an advanced	proficiency in the pe	erformance of experi	ments in materials science.		
Courses (t	type, number of weekly contact hours, la	anguage — if other than Ger	man)			
P (no info	ormation on SWS (weekly cont	act hours) and cours	e language available	n)		
wodule is cre Vortestate cal perfor	editable for bonus) e (pre-experiment exams) and rmance, log (5 to 10 pages)	Nachtestate (post-e		t every semester, information on whether 5 minutes), assessment of practi		
	e of assessment: German or Er	nglish				
Allocation	n of places					
 A J J!t!	-1 ! f 4!					
	al information					
 NA/ -	•					
Workload						
Toochin	englo					
Teaching	сусіе					
Defermed 4	to := 1001 /					
Kererred	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module =	nnoore in					
Module a	• •	242)				
	Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2010)					
	degree (1 major) Chemistry (20					



Modul	Module title Abbreviation					
Projec	t Work				08-FMM-PA-102-m01	
Modul	Module coordinator			Module offered by		
head o	f the re	search group offering the	e module	Chair of Chemical T	echnology of Material Synthesis	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts					
		ives students the opport findings.	unity to explore a res	earch topic under th	e guidance of a supervisor and to	
Intend	ed lear	ning outcomes				
Studer	nts have	e developed an advanced	proficiency in the pe	erformance of experi	ments in materials science.	
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (no i	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
		.5 minutes) and log (appr ssessment: German or E				
Alloca	tion of p	olaces				
Additio	onal inf	ormation				
Worklo	oad					
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Modul	Module appears in					
	Master's degree (1 major) Chemistry (2013)					
	_	ee (1 major) Chemistry (2				
Master	Naster's degree (1 major) Chemistry (2014)					



Module title					Abbreviation		
Organi	c Funct	ional Materials			08-0CM-FM-141-m01		
Module	e coord	inator		Module offered by			
lecture	r of the	seminar "Organische Fu	nktionsmaterialien"	Institute of Organic	Chemistry		
ECTS	Metho	od of grading	Only after succ. con	ıpl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its						
compo linear o	nents s optics.				r application in (opto)electronic ganic solar cells as well as in non		
near of	otics.	ield effect transistors, or			photovoltaics as well as in nonli-		
S (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)		
			ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and ler	a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English						
Allocat	ion of p	olaces					
Additio	Additional information						
	<del></del>						
Worklo	Workload						
			,				
Teachi	ng cycl	e					
	-						

Master's degree (1 major) Chemistry (2014)

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



Module	e title	-			Abbreviation		
Materi	al Scie	nces 1 (Principles)			08-FS1-141-m01		
Module	e coord	inator		Module offered by	<u> </u>		
Dean o	f Studi	es Funktionswerkstoffe (I	Functional Materials)	Chair of Chemical T	echnology of Material Synthesis		
ECTS	Meth	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	its						
		liscusses the fundamenta erties of materials.	al relations between o	themical bonding, th	ne structure, the microstructure		
Intend	ed lear	ning outcomes					
	tructur				al bonding, the structure, the to apply them to research pro-		
Course	<b>S</b> (type, 1	number of weekly contact hours, I	anguage — if other than Ger	man)			
V + Ü (ı	no info	rmation on SWS (weekly	contact hours) and co	urse language avail	able)		
		sessment (type, scope, langua ble for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and ler	utes) o g (app ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	oprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of	places					
Additio	nal inf	ormation					
Workload							
Teachi	ng cycl	e					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
	-						



# **Compulsory Electives**

(5 ECTS credits)



Module title					Abbreviation	
Material Sciences 2 (Materials)					08-FS2-141-m01	
Module coordinator				Module offered by		
Dean o	f Studi	es Funktionswerkstoffe (I	- unctional Materials)	Chair of Chemical Technology of Material Synthesis		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duration Module level		Other prerequisites				
1 semester		undergraduate				
Conten	ts					
This mo	odule d	leals with the fabrication	and properties of the	main material grou	ps.	
Intende	ed lear	ning outcomes				
	Students have developed a knowledge of the fabrication and properties of the main material groups and are able to apply that knowledge to research problems.					
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
V + Ü (r	no infor	rmation on SWS (weekly	contact hours) and co	urse language avail	able)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge $-$ if other than German, $\epsilon$	examination offered — if no	ot every semester, information on whether	
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English						
Allocation of places						
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	ars in				



Module title					Abbreviation	
Chemically and bio-inspired Nanotechnology for Material S				ynthesis	08-NTM-141-m01	
Module coordinator				Module offered by		
holder thesis	of the	Chair of Chemical Techno	logy of Material Syn-	Chair of Chemical T	echnology of Material Synthesis	
ECTS	Meth	od of grading	Only after succ. compl. of module(s)			
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
of analy	This module provides an introduction to the synthesis methods of sol-gel chemistry and discusses the methods of analysis used to characterise the generated materials. It also discusses the fundamental principles of biomineralisation and uses examples to introduce students to bio-inspired material synthesis.					
Intende	ed lear	ning outcomes				
Studen	ts have	e developed an advanced	knowledge of sol-ge	l chemistry and bior	mineralisation.	
Course	<b>S</b> (type, ı	number of weekly contact hours, l	anguage — if other than Ger	man)		
V + V (r	o info	rmation on SWS (weekly o	contact hours) and co	urse language avail	able)	
<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) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.						
Allocation of places						
<del></del>						
Additional information						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



Module title				Abbreviation			
Molecular Materials (Lecture)					08-FMM-CT-141-m01		
Module coordinator				Module offered by			
Dean o	f Studi	es Funktionswerkstoffe (F	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis		
ECTS	Metho	od of grading	Only after succ. com				
5	nume	rical grade					
Duratio	Duration Module level		Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
This mo	odule d	iscusses the theoretical	principles of molecul	ar and soft materials	5.		
Intende	ed lear	ning outcomes					
	Students have developed a knowledge of the principles of molecular and soft materials and are able to apply that knowledge to research problems.						
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)			
V + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	urse language avail	able)		
	<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) and examination							
Allocat	Allocation of places						
Additional information							
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						
Master'	's degr	ee (1 major) Chemistry (2	014)				



Module title					Abbreviation
Polymer Chemistry					03-FU-PM1-141-m01
Module coordinator				Module offered by	
holder of the Chair of Functional Materials in Medicine and Dentistry			ials in Medicine and	Faculty of Medicine	
ECTS	Meth	Method of grading Only after succ.		mpl. of module(s)	
5	nume	merical grade			
Duration		Module level	Other prerequisites		
1 semester		graduate			
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 are familiar with the fundamentals of polymer chemistry and the related methods for their characterisation.

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

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

- 03-FU-PM1-1-141: V (no information on SWS (weekly contact hours) and course language available)
- 03-FU-PM1-2-122: P (no information on SWS (weekly contact hours) and course language available)

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

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

## Assessment in module component 03-FU-PM1-1-141: Polymer Chemistry (Lecture)

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

#### Assessment in module component 03-FU-PM1-2-122: Polymer Chemistry (Practical course)

- 2 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each) and logs (approx. 5 pages each)

Assessment offered: once a year, summer semester
<ul> <li>Language of assessment: German, English if agreed upon with the examiner</li> </ul>
Allocation of places
Additional information
Workload
Teaching cycle
Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module title					Abbreviation	
Polymers II					03-PM2-122-m01	
Module	e coord	inator		Module offered by		
holder Dentist		Chair of Functional Mater	ials in Medicine and	Faculty of Medicine		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	numei	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
group a graphie	analysis es, poly				meation chromatography, end- block-copolymers, polymer topo-	
		ire an advanced knowled	dge of polymer synth	esis modification ar	ad characterication	
		umber of weekly contact hours, l			id characterisation.	
		mation on SWS (weekly			ahla)	
a) writt (30 mir	en exar	le for bonus) mination (approx. 90 min	utes) or b) oral exam		date each (20 minutes) or c) talk	
Allocat		ssessment: German or Ei	18(15)1			
	1011 01 }	naces				
Additio	nal info	ormation				
		ormacion .				
Worklo	ad					
Teachi	ng cycle	<u> </u>				
	3 3,30	-				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
	Master's degree (1 major) Chemistry (2013)					
Master	's degre	ee (1 major) Chemistry (2	014)			
Master	Master's degree (1 major) Technology of Functional Materials (2010)					



Module title					Abbreviation	
Nanoscale Materials					08-PCM3-102-m01	
Module coordinator				Module offered by		
lecture	lecturer of the seminar "Nanoskalige Materialien"			Institute of Physical and Theoretical Chemistry		
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
5	nume	rical grade				
Duratio	Duration Module level		Other prerequisites	Other prerequisites		
1 semester graduate						
Conten	Contents					

This module discusses advanced topics in nanoscale materials. It focuses on the structure, properties, fabrication, modern characterisation methods and application areas of nanoscale materials.

### **Intended learning outcomes**

Students are able to characterise nanoscale materials. They are able to name analytical methods and application areas of nanoscale materials.

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

S + 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)

written examination (90 minutes) or oral examination of one candidate each (20 minutes) or talk (30 minutes) Language of assessment: German or English

### Allocation of places

### **Additional information**

### Workload

### **Teaching cycle**

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

### Module appears in

Bachelor' degree (1 major) Nanostructure Technology (2010)

Bachelor' degree (1 major) Nanostructure Technology (2012)

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)



Module title					Abbreviation	
Suprar	nolecu	lar Chemistry (Basic	s)		08-SCM1-102-m01	
Module coordinator				Module offered	Module offered by	
lecturer of lecture "Organischen Chemie"			hemie"	Faculty of Chem	Faculty of Chemistry and Pharmacy	
ECTS	Meth	od of grading	Only after succ.	compl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisi	tes		
1 semester graduate						
Conten	its					
			•	•	ecular chemistry. It focuses on inte	

actions between molecules, molecular recognition by receptors, complexes, supramolecular polymers, coordination polymers and networks, liquid crystals, self-assembly in aqueous media, synthetic ion channels and modern applications of supramolecular chemistry.

### **Intended learning outcomes**

Students are able to explain interactions between molecules demonstrating a high degree of expertise in the field as well as to describe the formation, structure and polymers of coordination compounds. They are able to describe the self-assembly of polymers in aqueous media as well as to identify the characteristics of synthetic ion channels. They can name modern applications of supramolecular chemistry.

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

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

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

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

--

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

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### Module appears in

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)



Module title					Abbreviation		
Solid state chemistry and inorganic materials					08-ACM3-141-m01		
Modul	e coord	inator		Module offered by			
		ninar "Festkörperchemie Solid State Chemistry an		Institute of Inorgan	ic Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duration	on	Module level	Other prerequisites				
1 seme	ester	graduate					
Conter	ıts						
		provides an introduction to nthesis methods and sel			structure, chemical and physical		
Intend	ed lear	ning outcomes					
					plain methods for solid-state the corresponding solids.		
Course	S (type, i	number of weekly contact hours,	language — if other than Gei	rman)			
S (no i	nforma	tion on SWS (weekly con	tact hours) and cours	e language available	2)		
		sessment (type, scope, langua ble for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and le	utes) o og (app ngth of	r c) oral examination in g	groups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	tion of	places					
	-						
Additio	onal inf	ormation					
Worklo	oad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Modul	Module appears in						
	'c doar	ee (1 major) Chemistry (2	(014)				



### **Homogeneous Catalysis**



### **Compulsory Courses**



Module title Abbreviation							
Organo	Organo- and Biocatalysis 08-HKM1-141-mo1						
Module	coord	inator		Module offered by			
lecture	r of the	seminar "Organo- and B	iokatalyse"	Institute of Organic	Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
and ap	plicatio	on areas. Biocatalysis: ef			n chemistry, substance classes ects, especially regarding organic		
		ning outcomes					
scribe t	he stru				reas of application. They can de- able to mechanistically describe		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)			
S (no ir	format	ion on SWS (weekly cont	act hours) and cours	e language availabl	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if n	ot every semester, information on whether		
30 min or d) lo and ler	utes) o g (appi igth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, ;	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Workload							
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module appears in



Module title					Abbreviation		
Advano lysis	ced org	anometallic chemistry a	08-HKM2-141-m01				
Modul	e coord	inator		Module offered by			
		seminar "Spezielle Meta wendung in der Homoger		Institute of Inorgan	ic Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duration	on	Module level	Other prerequisites				
1 seme	ester	graduate					
Conter	nts						
This m tions.	odule e	examines elementary orga	anic compounds of tr	ansition metals with	homogeneous catalytic applica-		
Intend	ed lear	ning outcomes					
		•		•	nentary organic compounds. They neous catalysis reactions.		
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Gei	man)			
S (no i	nforma	tion on SWS (weekly con	tact hours) and cours	e language available	2)		
		<b>Sessment</b> (type, scope, langua	ge — if other than German,	examination offered — if no	t every semester, information on whether		
30 min or d) lo and le	nutes) o og (appi ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	tion of <sub> </sub>	places					
Additio	onal inf	ormation					
Worklo	oad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Modul	Module appears in						
AA .	M						



Module title Abbreviation						
Practical course Homogeneous catalysis in Inorganic Chemistry 08-HKM3AC-132-mo1						
Modul	e coord	inator		Module offered by	I.	
		seminar "Spezielle Meta wendung in der Homoger		Institute of Inorgan	ic Chemistry	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts					
thods i	in homo ystallog	geneous catalysis. The f	ocus will be on cataly expected to conduct t	st synthesis and ch	synthesis and analytical mearacterisation, spectral analysis independently, write a lab report	
Intend	ed lear	ning outcomes				
					eneous catalysis in the lab and to dings and deliver a presentation.	
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
P (no i	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
		with lab report (approx. ssessment: German or E		pprox. 15 minutes)		
Allocat	tion of p	olaces				
Additio	onal inf	ormation				
Additio	nal inf	ormation on module dura	tion: block placemer	nt with a duration of	a minimum of 20 working days.	
Worklo	oad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Modul	Module appears in					

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



Module	Module title Abbreviation							
		an Unmaranaya satalya	eie in Overenie Chemie	. <b>.</b>	<del> </del>			
Practic	Practical course Homogeneous catalysis in Organic Chemistry 08-HKM3OC-132-mo1							
Module	e coord	inator		Module offered by				
		seminar "Spezielle Meta wendung in der Homoger		Institute of Organio	c Chemistry			
ECTS		od of grading	Only after succ. con	ipl. of module(s)				
5	(not)	successfully completed						
Duratio	on	Module level	Other prerequisites					
1 seme	ster	graduate						
Conten	its							
thods i and cry	n homo stallog	ogeneous catalysis. The f	ocus will be on cataly expected to conduct t	st synthesis and ch	synthesis and analytical me- naracterisation, spectral analysis independently, write a lab report			
Intend	ed lear	ning outcomes						
					eneous catalysis in the lab and to dings and deliver a presentation.			
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)				
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language availabl	e)			
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if n	ot every semester, information on whether			
		with lab report (approx. ssessment: German or E		pprox. 15 minutes)				
Allocat	ion of p	places						
Additio	nal inf	ormation						
Additio	nal inf	ormation on module dura	ation: block placemer	nt with a duration of	a minimum of 20 working days.			
Worklo	ad							
Teaching cycle								
Referred to in LPO I (examination regulations for teaching-degree programmes)								
Module	Module appears in							

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



## **Compulsory Electives**



Modul	Module title Abbreviation						
Advanced transition metal chemistry 08-HKM4-141-mo1					08-HKM4-141-m01		
Modul	e coord	inator		Module offered by			
lecture	er of the	seminar "Spezielle Übe	rgangsmetallchemie"	Institute of Inorgan	ic Chemistry		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duration	on	Module level	Other prerequisites				
1 seme	ester	graduate					
Conter	nts						
nation	chemis				y of transition metals and coordidiscusses recent developments		
Intend	ed lear	ning outcomes					
		able to explain transitior field. They can explain t			monstrating a high degree of exchemistry.		
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Ger	man)			
S (no i	nformat	tion on SWS (weekly con	tact hours) and cours	e language availabl	e)		
		<b>sessment</b> (type, scope, langu ble for bonus)	age — if other than German, o	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and le	nutes) o og (appi ngth of	r c) oral examination in s	groups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type		
Alloca	tion of p	places					
Additio	onal inf	ormation					
Worklo	oad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Modul	Module appears in						
	nouse appears						



Modul	e title				Abbreviation	
Chemi	cal Dyn	amics			08-PCM2-102-m01	
Modul	e coord	inator		Module offered by		
	r of sen	ninar "Chemische Dynam	ik" (Chemical Dyna-	Institute of Physica	l and Theoretical Chemistry	
mics)	1		Γ			
ECTS	1	od of grading	Only after succ. con	ipl. of module(s)		
5	•	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme		graduate	<u> </u>			
Conter	ıts					
					nical kinetics and reaction dyna- cribing chemical reactions.	
Intend	ed learı	ning outcomes				
		able to discuss advanced dels for the investigation			dynamics. They can describe me	
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)		
S + Ü (	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	lable)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
		nation (90 minutes) or or ssessment: German or E		e candidate each (20	o minutes) or talk (30 minutes)	
	tion of p					
Additio	onal inf	ormation				
Worklo	oad					
Teachi	ng cycl	е				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master	Master's degree (1 major) Chemistry (2013)					
	_	ee (1 major) Chemistry (2				
Maste	Master's degree (1 major) Chemistry (2014)					

Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)



**	OKZBO	1	5 (25) 28 8	33 <b>9 ~ 5</b> 7	Master's with 1 major, 120 ECTS credits		
Modul	Module title Abbreviation						
Moder	n Synth	netic Methods			08-OCM-SYNT-141-m01		
Modul	e coord	inator		Module offered	by		
lecture	er of the	seminar		Institute of Orga	anic Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ester	graduate					
Conter	nts						
		liscusses modern stereos emistry and catalysis.	selective synthesis m	ethods. It focuse	es on selected total syntheses, orga-		
Intend	ed lear	ning outcomes					
They c		ain total syntheses. They			d to stereochemically analyse them. llic chemistry and catalysis in synthe		
Course	<b>es</b> (type, r	number of weekly contact hours,	anguage — if other than Ger	man)			
S + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language a	vailable)		
		<b>sessment</b> (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered —	- if not every semester, information on whether		
30 min or d) lo and le	a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English						
Allocation of places							
Additional information							
Worklo	Workload						

### **Teaching cycle**

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

### Module appears in



Module	Module title Abbreviation					
Compu	Computational Chemistry 08-TCM2-141-mo1					
Module	e coord	inator		Module offered by		
lecture	r of lect	ture "Computational Che	mistry"	Institute of Physica	l and Theoretical Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its		,			
This m	odule ir	ntroduces students to the	e fundamental princip	oles of computationa	al chemistry.	
Intend	ed learı	ning outcomes				
		able to explain the theore	etical principles of co	mputational chemist	try and to apply methods in com-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S + Ü (ı	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		sessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	et every semester, information on whether	
30 min or d) lo and ler	utes) o g (appr ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
	module appears in					



Module	e title	"		Abbreviation		
Polymer Chemistry					03-FU-PM1-141-m01	
Module	e coord	linator		Module offered by		
holder of the Chair of Functional Materials in Medicine and Dentistry				Faculty of Medicine		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duration Module level		Other prerequisites				
1 semester graduate						
Conton	Contonts					

#### **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 are familiar with the fundamentals of polymer chemistry and the related methods for their characterisation.

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

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

- 03-FU-PM1-1-141: V (no information on SWS (weekly contact hours) and course language available)
- 03-FU-PM1-2-122: P (no information on SWS (weekly contact hours) and course language available)

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

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

### **Assessment in module component 03-FU-PM1-1-141:** Polymer Chemistry (Lecture)

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

### Assessment in module component 03-FU-PM1-2-122: Polymer Chemistry (Practical course)

- 2 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each) and logs (approx. 5 pages each)
- Assessment offered: once a year, summer semester

# • Language of assessment: German, English if agreed upon with the examiner Allocation of places **Additional information** Workload **Teaching cycle Referred to in LPO I** (examination regulations for teaching-degree programmes)

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	reg. data record Master (120 ECTS) Chemie - 2014	



### Module appears in



## **Medicinal Chemistry**



### **Compulsory Courses**



Module title					Abbreviation	
Practic	al cour	se medicinal chemistry			08-MCM1-102-m01	
Module	Module coordinator			Module offered by		
lecture mistry)	rs Phar	mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
10	(not)	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Selecte	d meth	nods and topics in medic	inal chemistry (synth	esis, testing, analysi	is, theory, pharmacokinetics).	
Intende	ed lear	ning outcomes				
Studen	ts have	e developed a knowledge	of medicinal chemis	stry and are able to a	pply it to practical experiments.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ge	rman)		
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
wodule is Vortest of prac	creditab ate (pr tical pe	ole for bonus) e-experiment exams) and erformance, written repor	I Nachtestate (post-e t (approx. 30 to 50 pa	xperiment exams) (a	approx. 20 minutes), assessment	
Allocat		ssessment: German or E	ilgiisii			
Allocal	ן וט ווטון	Diaces				
Δdditio	nal inf	ormation				
	mat min	omation				
Worklo						
	- uu					
Teachi	ng cycl	<u> </u>				
	3 0,00					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in						
Master Master Master	Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2010) Master's degree (1 major) Chemistry (2014) Master's degree (1 major) FOKUS Pharmacy (2012)					



Module	Module title Abbreviation					
Pharma	ceutic	al/Medicinal Chemistry :	1		08-MCM2a-141-m01	
Module	coord	inator		Module offered by	I.	
lecture mistry)	rs Phar	mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	ıpl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
structuin the n	re-activ nodule	vity relationships; molecu	ular effect mechanisn thesis; biotransforma	ns; pharmacological	gies for active agent discovery; principles of the drugs discussed tics of individual drugs; history of	
		ning outcomes				
		e developed a knowledge	·			
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (no in	ıformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)	
		sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo	utes) o g (appı	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master'	Master's degree (1 major) Chemistry (2014)					



Module title Abbrev					Abbreviation		
Pharmaceutical/Medicinal Chemistry 2					08-MCM2b-141-m01		
Module coordinator				Module offered by			
lecture mistry)		mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites	i .			
1 seme	ster	graduate					
Conten	ts						
in the r drug de	nodule evelopr	; drug analysis; drug syn nent: discussion of spec	thesis; biotransform		principles of the drugs discussed tics of individual drugs; history of		
		ning outcomes					
		e developed a knowledge		· · · · · · · · · · · · · · · · · · ·			
	-	number of weekly contact hours, l			٠)		
		tion on SWS (weekly cont					
		le for bonus)	ige — ir otner than German,	examination offered — if no	ot every semester, information on whether		
30 min or d) lo	utes) o g (appi	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 i	pprox. 30 minutes,	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module							
Master	Master's degree (1 major) Chemistry (2014)						



Module title					Abbreviation		
Principles of drug design					08-MCM3-132-m01		
Module	e coord	inator		Module offered by	<u> </u>		
lecture mistry)		mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its						
cophor QSAR. gies, b	re mode Predict ioisoste	els, docking, virtual scree ions of pharmacokinetic erism, SAR.	ning, simulation met	hods, de novo desig	re-based drug design, pharma- rn. Ligand-based drug design. ase examples, prodrug strate-		
Intend	ed learı	ning outcomes					
Studer	its mas	ter the theoretical and ex	perimental methods	and aspects of drug	design.		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S + Ü (ı	no infor	mation on SWS (weekly o	contact hours) and co	urse language avail	able)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether		
		vith discussion (approx. : ssessment: German or Er					
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						
	Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2014)						



## **Supramolecular Chemistry**



## **Compulsory Courses**

(10 ECTS credits)



Module title					Abbreviation	
Supramolecular Chemistry (Basics)					08-SCM1-102-m01	
Modul	e coord	linator		Module offered by	I.	
lecturer of lecture "Organischen Chemie"			mie"	Faculty of Chemistry and Pharmacy		
ECTS	Meth	od of grading	Only after succ. compl. of module(s)			
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites	Other prerequisites		
1 seme	ester	graduate				
Contents						
This module introduces students to the fundamental principles of supramolecular chemistry. It focuses on interactions between molecules, molecular recognition by receptors, complexes, supramolecular polymers, coordi-						

actions between molecules, molecular recognition by receptors, complexes, supramolecular polymers, coordination polymers and networks, liquid crystals, self-assembly in aqueous media, synthetic ion channels and modern applications of supramolecular chemistry.

### **Intended learning outcomes**

Students are able to explain interactions between molecules demonstrating a high degree of expertise in the field as well as to describe the formation, structure and polymers of coordination compounds. They are able to describe the self-assembly of polymers in aqueous media as well as to identify the characteristics of synthetic ion channels. They can name modern applications of supramolecular chemistry.

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

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

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

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

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### Module appears in

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)



Module title Abbreviation					Abbreviation		
Supramolecular Chemistry (Practical Course)					08-SCM2-102-m01		
Module	e coord	inator		Module offered by			
		ture "Supramolekularen ( kalische Chemie)"	Chemie (Organische	Faculty of Chemistr	y and Pharmacy		
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)			
5	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate	-				
Conten	its						
mistry.	They w		nost-guest complexe		ents in supramolecular che- d nanoparticles and use advan-		
Intend	ed lear	ning outcomes					
Studer	its are a				roscopic methods to analyse and hem microscopically.		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)			
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	2)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether		
		, logs (approx. 5 pages e ssessment: German or E					
Allocat	ion of	olaces	, <del>-</del>				
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in							
Master Master	Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2010) Master's degree (1 major) Chemistry (2014)						



Module title					Abbreviation			
Bioorganic Chemistry					08-SCM3-141-m01			
Modu	le coord	inator		Module offered by				
lecture Chemi		ture "Bioorganische Che	mie" (Bioorganic	Institute of Organio	c Chemistry			
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)				
5	nume	rical grade						
Durati	ion	Module level	Other prerequisites	i				
1 sem	ester	graduate						
Conte	nts							
lar inte	eraction				medicine. It focuses on molecu- , new aspects of DNA, RNA, prote-			
Intend	led lear	ning outcomes						
can ex can de	kplain the escribe l es (type, r	ne molecular diversity of modern aspects of DNA, number of weekly contact hours,	biological systems. T RNA, proteins and ca <sub>language</sub> — if other than Ge	hey can characterise rbohydrates. <sup>rman)</sup>	e the fabrication of agents. They			
		tion on SWS (weekly con						
		<b>sessment</b> (type, scope, langua ble for bonus)	age — if other than German,	examination offered — if n	ot every semester, information on whether			
30 min or d) lo and le	nutes) o og (app ength of	r c) oral examination in g	groups (groups of 2: a entation (approx. 30 c course.	pprox. 30 minutes,	re candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type			
Alloca	tion of	olaces						
Additi	onal inf	ormation						
Workload								
Teaching cycle								
Referr	ed to in	LPO I (examination regulation	s for teaching-degree progra	ammes)				
	-							

Module appears in



## **Compulsory Electives**

(15 ECTS credits)

No less than one of the two modules o8-SCM3 or o8-PCM5 must be completed in the focus.



Module title Abbreviation							
		emistry			08-SCM3-141-m01		
				M - dul			
	e coord			Module offered by			
Chemi:		ture "Bioorganische Cher	nie" (Bioorganic	Institute of Organic	Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duration	on	Module level	Other prerequisites	i			
1 seme	ster	graduate					
Conter	its						
lar inte	raction				medicine. It focuses on molecu- new aspects of DNA, RNA, prote-		
Intend	ed learı	ning outcomes					
can ex	plain th		oiological systems. T	hey can characterise	s of bioorganic chemistry. They the fabrication of agents. They		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ge	rman)			
S (no i	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and le	utes) o og (appr ogth of	r c) oral examination in g	roups (groups of 2: a ntation (approx. 30 i ourse.	pprox. 30 minutes, §	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	tion of p	olaces					
	,						
Additio	onal inf	ormation					
Workload							
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module appears in



Module title Abbreviation						
Physical chemisti	y of supramolecular	assemblies		o8-PCM5-141-mo1		
Module coordinat	or		Module offered by			
lecturer of the sen kularer Strukturer	ninar "Physikalische ( "	Chemie Supramole-	Institute of Physica	l and Theoretical Chemistry		
ECTS Method o	f grading	Only after succ. con	ıpl. of module(s)			
5 numerical	grade					
Duration Mo	dule level	Other prerequisites				
1 semester gra	duate					
Contents						
	nines the basic intera ggregates as well as			he formation and physical-cheministry.		
Intended learning	outcomes					
in the field. They		ation and physical-cl		trating a high degree of expertise of aggregates. They can name mo-		
Courses (type, numb	er of weekly contact hours, l	anguage — if other than Ger	man)			
S + Ü (no informat	tion on SWS (weekly o	contact hours) and co	ourse language avail	able)		
Method of assess module is creditable for		ge — if other than German, (	examination offered — if no	ot every semester, information on whether		
(approx. 30 minut			on of one candidate	each (approx. 20 minutes) or talk		
Allocation of plac	es					
Additional inform	ation					
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
	ı major) Chemistry (20	014)				



Module title					Abbreviation	
Bioano	rganic	Chemistry			08-ACM2-141-m01	
Module	e coord	inator		Module offered by		
and Me	edizinis	minar "Anorganische Aspo schen Chemie" (Inorganic edicinal Chemistry)		Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		,			
	ds of B				chemistry (BIC). It discusses the ns of BIC in the fields of diagnosis	
Intend	ed lear	ning outcomes				
		able to describe the princ us enzymes and describe			xplain the structure and effects medicine.	
Course	S (type, i	number of weekly contact hours, l	anguage — if other than Ger	rman)		
S (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
30 min or d) lo and ler	utes) o g (app ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of	places				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
<del></del>						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appe	ars in				
Master	Master's degree (1 major) Chemistry (2014)					



Module	Module title Abbreviation						
Princip	les of c	lrug design			08-MCM3-132-m01		
Module	e coord	inator		Module offered by			
lecture mistry)	lecturers Pharmazeutische Chemie (Pharmaceutical Ch			Institute of Pharmacy and Food Chemistry			
ECTS	Metho	od of grading	Only after succ. compl. of module(s)				
5	nume	rical grade					
Duration Module level Other prerequisites							
1 seme	1 semester graduate						
Conten	its						
cophor QSAR. gies, b	turally occurring substances. Theoretical methods: molecular modelling, structure-based drug design, pharma-cophore models, docking, virtual screening, simulation methods, de novo design. Ligand-based drug design. QSAR. Predictions of pharmacokinetic and toxicological components (ADME). Case examples, prodrug strategies, bioisosterism, SAR.  Intended learning outcomes						
	-	ter the theoretical and ex	vnorimental methods	and acnosts of drug	docian		
				· ·	uesigii.		
	Courses (type, number of weekly contact hours, language — if other than German)  S + Ü (no information on SWS (weekly contact hours) and course language available)						
Metho	d of ass	sessment (type, scope, langua			ot every semester, information on whether		
presen	presentation with discussion (approx. 30 minutes) Language of assessment: German or English						
Allocat	ion of p	olaces					
	1						
Additio	nal inf	ormation					
Worklo	Workload						
<del></del>							
Teaching cycle							
<del></del>							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
<del></del>							
Module appears in							
	Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2014)						



Module	Module title Abbreviation						
Computational Chemistry					08-TCM2-141-m01		
Module	e coord	inator		Module offered by			
lecture	r of lect	ture "Computational Che	mistry"	Institute of Physical and Theoretical Chemistry			
ECTS	Metho	od of grading	Only after succ. con				
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its		,				
This m	odule ir	ntroduces students to the	e fundamental princip	oles of computationa	al chemistry.		
Intend	ed learı	ning outcomes					
		able to explain the theore	etical principles of co	mputational chemist	try and to apply methods in com-		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S + Ü (ı	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
	<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) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English							
Allocation of places							
Additional information							
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
modute appears in							



W	ÜRZBU	IRG T	5 ( ) ( ) ( )	3 0 2 1	Master's with 1 major, 120 ECTS credits	
Module title Abbreviation					Abbreviation	
Organi	Organic Functional Materials				08-OCM-FM-141-m01	
Module	Module coordinator			Module offered by		
lecture	r of the	seminar "Organische Fu	nktionsmaterialien"	Institute of Organic Chemistry		
ECTS	Metho	od of grading	Only after succ. compl. of module(s)			
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		,			
sical effects in organic molecular and polymeric semiconductors as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in non-linear optics.  Intended learning outcomes  The students are able to explain fundamental (photo)physical processes in organic semiconductors. He/She can explain the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlinear optics.						
Courses (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)						
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, 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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 $\textbf{Referred to in LPO I} \ \ (\text{examination regulations for teaching-degree programmes})$ 

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### Module appears in



Module title				Abbreviation	
Nanoscale Materials					08-PCM3-102-m01
Module coordinator				Module offered by	
lecturer of the seminar "Nanoskalige Materialien"			laterialien"	Institute of Physical and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. compl. of module(s)		
5	nume	rical grade			
Duration Module level		Module level	Other prerequisites		
1 semester		graduate			
Contents					

This module discusses advanced topics in nanoscale materials. It focuses on the structure, properties, fabrication, modern characterisation methods and application areas of nanoscale materials.

### **Intended learning outcomes**

Students are able to characterise nanoscale materials. They are able to name analytical methods and application areas of nanoscale materials.

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

S + 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)

written examination (90 minutes) or oral examination of one candidate each (20 minutes) or talk (30 minutes) Language of assessment: German or English

### Allocation of places

### **Additional information**

### Workload

### **Teaching cycle**

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

### Module appears in

Bachelor' degree (1 major) Nanostructure Technology (2010)

Bachelor' degree (1 major) Nanostructure Technology (2012)

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)



# **Theoretical Chemistry**

(25 ECTS credits)



# **Compulsory Courses**

(10 ECTS credits)



Module title	Module title Abbreviation						
Theoretical (	Chemistry (Basics)		08-TCM1-141-m01				
Module coordinator			Module offered by				
lecturer of le	cture "Theoretische Chem	ie"	Institute of Physica	l and Theoretical Chemistry			
ECTS Meti	nod of grading	Only after succ. con	npl. of module(s)				
5 num	erical grade						
Duration	Module level	Other prerequisites					
1 semester	graduate						
Contents							
This module	introduces students to the	e fundamental princi <sub>l</sub>	oles of theoretical ch	nemistry.			
Intended lea	rning outcomes						
	able to describe the math		al principles underly	ing the quantum chemical and			
Courses (type	number of weekly contact hours,	language — if other than Ge	rman)				
S + Ü (no infe	ormation on SWS (weekly	contact hours) and co	ourse language avail	able)			
Method of as		ge — if other than German,	examination offered — if no	ot every semester, information on whether			
30 minutes) or d) log (app and length o	or c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type			
Allocation of	places						
Additional in	formation						
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
Master's deg	Master's degree (1 major) Chemistry (2014)						



Module	Module title Abbreviation						
		in Theoretical Chamic		<del> </del>			
Progra	Programming in Theoretical Chemistry 08-TCM3-102-mo1						
Module	e coord	linator		Module offered by			
lecture mie"	r of lec	ture "Programmieren ir	Theoretischer Che-	Institute of Physica	al and Theoretical Chemistry		
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)			
5	nume	erical grade					
Duratio	on	Module level	Other prerequisites	i			
1 seme	ster	graduate					
Conten	ıts	, -					
		orovides an introductio ation areas.	n to the fundamentals	of programming in t	heoretical chemistry and discus-		
Intend	ed lear	ning outcomes					
		able to explain and use		ng languages typica	lly used in theoretical chemistry		
Course	S (type,	number of weekly contact hou	s, language — if other than Ge	rman)			
S + Ü (ı	no info	rmation on SWS (week	ly contact hours) and c	ourse language avai	lable)		
		sessment (type, scope, langular for bonus)	guage — if other than German,	examination offered — if n	ot every semester, information on whether		
		nd discussion of appro assessment: German o		ises as well as talk	(approx. 45 minutes)		
Allocat	tion of	places					
Additio	onal inf	formation					
Worklo	oad						
Teachi	ng cyc	le					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in							
Master's degree (1 major) Chemistry (2013)							
	Master's degree (1 major) Chemistry (2010)						
	_	ree (1 major) Chemistry					
Master	Master's degree (1 major) Mathematics (2012)						

Master's degree (1 major) Mathematics (2010)

Master's degree (1 major) Computational Mathematics (2012)



# **Compulsory Electives**

(15 ECTS credits)

Two of the three modules o8-TCAP1, o8-TCAP2 and o8-TCAP3 must be taken.



Module	Module title Abbreviation						
Computational Chemistry 08-TCM2					08-TCM2-141-m01		
Module coordinator N				Module offered by	I.		
lecture	r of lect	ture "Computational Che	mistry"	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
This mo	odule ir	ntroduces students to th	e fundamental princij	oles of computation	al chemistry.		
Intende	ed lear	ning outcomes					
		able to explain the theoremistry.	etical principles of co	mputational chemis	try and to apply methods in com-		
Course	<b>S</b> (type, r	number of weekly contact hours,	language — if other than Ger	rman)			
S + Ü (r	no infor	rmation on SWS (weekly	contact hours) and co	ourse language avail	lable)		
		sessment (type, scope, languable for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and ler	utes) o g (appi igth of	r c) oral examination in g	groups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type		
Allocat	ion of p	places	-				
Additio	nal inf	ormation					
Worklo	ad						
	<del></del>						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						



Module	Module title Abbreviation					
Theoretical Chemistry - Project course wave-packet dynamics 08-TCAP1-132-mo1					08-TCAP1-132-m01	
Module	e coord	inator		Module offered by		
head o	f the re	search group offering the	e module	Institute of Physica	l and Theoretical Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	(not) s	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
the Ins	titute o				f the research groups based at used in the discipline. The focus	
Intende	ed learı	ning outcomes				
		e learned some of the me			stry and, in particular, in wave f wave packet dynamics.	
Course	<b>S</b> (type, n	umber of weekly contact hours, I	anguage — if other than Ger	rman)		
P (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		approx. 30 minutes) ssessment: German or E	nglish			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Additio	nal info	ormation on module dura	ition: 4 weeks.			
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



Modul	Module title Abbreviation						
	<del></del>	nemistry - Project course	methods	08-TCAP2-132-m01			
			1				
Modul	le coord	inator		Module offered by			
head o	of the re	search group offering the	e module	Institute of Physica	l and Theoretical Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed					
Durati	on	Module level	Other prerequisites	i			
1 seme	ester	graduate					
Conte	nts						
the Ins	stitute o				f the research groups based at ised in the discipline. The focus		
Intend	led lear	ning outcomes					
					stry and, in particular, in wave of wave function methods.		
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Ger	rman)			
P (no i	nforma	tion on SWS (weekly cont	tact hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether		
•		(approx. 30 minutes) ssessment: German or E	nglish				
Alloca	tion of <sub> </sub>	olaces					
Additi	onal inf	ormation					
Additi	onal inf	ormation on module dura	ation: 4 weeks.				
Workl							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
	-						

Master's degree (1 major) Chemistry (2013)



Module	Module title Abbreviation					
Theore	Theoretical Chemistry - Project course Computational Photochemistry 08-TCAP3-132-m01					
Module	coord	inator		Module offered by	, /	
head of	f the re	search group offering the	module	Institute of Physic	al and Theoretical Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
the Inst	titute o				of the research groups based at used in the discipline. The focus	
Intende	ed lear	ning outcomes				
					nistry and, in particular, in theoretid of theoretical photochemistry.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (no in	ıformat	tion on SWS (weekly cont	act hours) and cours	e language availab	le)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if	not every semester, information on whether	
		(approx. 30 minutes) ssessment: German or Er	nglish			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Additio	nal inf	ormation on module dura	tion: 4 weeks.			
Worklo	Workload					
Teachir	Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



Module title Abbreviation						
Princip	les of c	drug design			08-MCM3-132-m01	
Module	e coord	inator		Module offered by		
lecture mistry)		mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its					
cophor QSAR. gies, b	e mode Predict ioisoste	els, docking, virtual scree	ening, simulation met	hods, de novo desig	re-based drug design, pharma- rn. Ligand-based drug design. ase examples, prodrug strate-	
	-	ter the theoretical and ex	vnorimental methods	and acports of drug	docian	
		number of weekly contact hours,		· ·	uesigii.	
		rmation on SWS (weekly			ahle)	
Metho	d of ass	sessment (type, scope, langua			ot every semester, information on whether	
presen	tation v	le for bonus) with discussion (approx. ssessment: German or E				
Allocat	ion of p	olaces				
	1					
Additio	nal inf	ormation				
Worklo	ad					
			_			
Teachi	Teaching cycle					
	<del></del>					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	<del></del>					
	Module appears in					
	Master's degree (1 major) Chemistry (2013)					
Master	Master's degree (1 major) Chemistry (2014)					



# **Additional qualifications**

(15 ECTS credits)

# **Additional qualifications Compulsory Electives Focuses**

(5 ECTS credits)

Module from the Focuses (Schwerpunkte) area of mandatory electives that has not been used as part of a focus subject.



Module title Abbreviation							
Advan	ced Ino	rganic Chemistry		08-ACM1-141-m01			
Module coordinator				Module offered by			
Manag	ing Dir	ector of the Institute of In	organic Chemistry	Institute of Inorgan	nic Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
10	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
2 seme	ester	graduate					
Conter	nts						
specia	l comp		elements (MGEs), bo		metal chemistry. It focuses on MGEs and MGE compounds, the		
Intend	ed lear	ning outcomes					
the che	emical rdinatio	properties of transition mon compounds.	netals and analyse th	e structure as well a	roup elements. They can describe s chemical and physical aspects		
	_	number of weekly contact hours,					
		rmation on SWS (weekly	· · · · · · · · · · · · · · · · · · ·				
		<b>sessment</b> (type, scope, langua ble for bonus)	age — if other than German,	examination offered — if n	ot every semester, information on whether		
30 min or d) lo and le	utes) o og (app ngth of	or c) oral examination in g	groups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes,	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type		
Allocat	tion of	places					
Additio	onal inf	ormation					
Workload							
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						



Module title Abbreviation					Abbreviation		
Bioanorganic Chemistry					08-ACM2-141-m01		
Modul	e coord	inator		Module offered by	<u>l</u>		
and M	edizinis	ninar "Anorganische Aspo schen Chemie" (Inorganic edicinal Chemistry)		Institute of Inorgan	ic Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Durati	on	Module level	Other prerequisites	i			
1 seme	ester	graduate					
Conte	nts						
	ds of BI				chemistry (BIC). It discusses the ns of BIC in the fields of diagnosis		
Intend	ed lear	ning outcomes					
		able to describe the princus enzymes and describe	•		xplain the structure and effects medicine.		
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)			
S (no i	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	<u>e)</u>		
		sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
30 mir or d) lo and le	nutes) o og (appi ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Alloca	tion of <sub> </sub>	places					
Additio	onal inf	ormation					
Workle	Workload						
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Modul	Module appears in						
	Master's degree (1 major) Chemistry (2014)						



Module title					Abbreviation		
Solid state chemistry and inorganic materials					08-ACM3-141-m01		
Modul	e coord	inator		Module offered by			
		ninar "Festkörperchemie Solid State Chemistry and		Institute of Inorgan	ic Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5		rical grade					
Durati	on	Module level	Other prerequisites				
1 seme	ester	graduate					
Conte	nts						
		provides an introduction t nthesis methods and sel			structure, chemical and physical		
Intend	ed lear	ning outcomes					
					plain methods for solid-state the corresponding solids.		
Course	es (type, i	number of weekly contact hours, l	anguage — if other than Ge	rman)			
S (no i	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)		
		sessment (type, scope, langua ble for bonus)	${\sf ge-if}$ other than German,	examination offered — if no	t every semester, information on whether		
30 mir or d) lo and le	nutes) o og (app ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Alloca	tion of	places					
Additio	onal inf	ormation					
Workle	oad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
	Module appears in						
Maste	Master's degree (1 major) Chemistry (2014)						



Modul	e title			Abbreviation		
Moder	Modern Synthetic Methods				08-OCM-SYNT-141-m01	
Modul	e coord	inator		Module offered by		
lecture	r of the	seminar		Institute of Organic	: Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i .		
1 seme	ester	graduate				
Conter	nts					
		liscusses modern stereo emistry and catalysis.	selective synthesis m	ethods. It focuses o	n selected total syntheses, orga-	
Intend	ed lear	ning outcomes				
They ca		ain total syntheses. They			stereochemically analyse them. chemistry and catalysis in synthe-	
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
S + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	lable)	
		<b>sessment</b> (type, scope, langu le for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and lei	utes) o og (appi ngth of	r c) oral examination in §	groups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, §	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	Allocation of places					
Additional information						
Workload						
Teachi	Teaching cycle					

Master's degree (1 major) Chemistry (2014)

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



Module	Module title Abbreviation					
Advanced NMR- and Mass Spectrometry 08-OCM-NMRMS-141-mo					08-0CM-NMRMS-141-m01	
Module	coord	inator		Module offered by		
lab cou	ırse su	pervisor		Institute of Organic	Chemistry	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
sights i	into the		the two measuring to	echniques and inclu	pectrometry. It offers deeper indes exercises that give students meter.	
Intend	ed lear	ning outcomes				
		able to discuss NMR and to experiment with both			n degree of expertise in the field. spectra.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (no ir	format	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
		<b>sessment</b> (type, scope, langua le for bonus)	${\sf ge-if}$ other than German, ${\sf German}$	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and ler	utes) o g (appi igth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					



Module title					Abbreviation	
Modern Aspects of Natural Product Chemistry and Biological Chemistry					08-OCM-NAT-141-m01	
Module coordinator Module				Module offered by		
lecture	r of the	seminar		Institute of Organic	Chemistry	
ECTS	Metho	d of grading	Only after succ. com	npl. of module(s)		
5	numer	ical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
This mo	odule d	iscusses advanced topic	s in natural product o	themistry and biolog	gical chemistry.	
Intende	ed learr	ning outcomes				
Studen	ts are a	ble to discuss advanced	topics in natural pro	duct chemistry and	biological chemistry.	
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)		
S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	e)	
		<b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
30 minu or d) log and len	utes) or g (appr gth of a	rc) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocati	ion of p	laces				
Chemis	try Mas	ster's: no restrictions. Bio	ochemistry Master's:	20 places. Places wi	ill be allocated by lot.	
Additio	nal info	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master'	Master's degree (1 major) Chemistry (2014)					



	Module title Abbreviation							
Organic Functional Materials 08-OCM-FM-141-mo1					08-OCM-FM-141-m01			
Modul	e coord	linator		Module offered	by			
lecture	er of the	e seminar "Organische Fu	nktionsmaterialien"	Institute of Orga	anic Chemistry			
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)				
5	nume	rical grade						
Durati	on	Module level	Other prerequisites					
1 seme	ester	graduate						
Conter	ıts							
components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in non linear optics.  Intended learning outcomes  The students are able to explain fundamental (photo)physical processes in organic semiconductors. He/She can explain the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonli-								
explaiı ents sı		near optics.						
explaii ents si near o	ptics.	number of weekly contact hours.	 language — if other than Ger	rman)				
explaii ents si near o <b>Course</b>	ptics. es (type,	number of weekly contact hours, tion on SWS (weekly cont			·			
explainents some ar o Course S (no i Metho	ptics.  s (type, informa  d of as	tion on SWS (weekly con	tact hours) and cours	e language avail	·			

**Allocation of places** 

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### **Additional information**

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### Workload

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## **Teaching cycle**

--

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

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### Module appears in



Module title					Abbreviation		
Ultrafa	st spec	troscopy and quantumce	ontrol		08-PCM4-141-m01		
Module coordinator				Module offered by			
lecture Quante		seminar "Ultrakurzzeits¡ olle"	oektroskopie and	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate	Prior successful con ly recommended.	npletion of modules	o8-PCM1a and o8-PCM1b is high-		
Conten	ts						
		iscusses advanced topic ime-resolved laser spect			control. It focuses on ultrashort		
Intende	ed lear	ning outcomes					
plain th princip	ne theo les and		spectroscopy and na n control.	me experimental me	naracterise them. They can ex- ethods. They can describe the		
	-	rmation on SWS (weekly			able)		
Method	d of ass		- · · · · · · · · · · · · · · · · · · ·		ot every semester, information on whether		
(approx	x. 30 m			on of one candidate	each (approx. 20 minutes) or talk		
Allocat							
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
<del></del>							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
<del></del>							
Module	Module appears in						
Master	Master's degree (1 major) Chemistry (2014)						



Module title Abbreviation							
Physica	al chen	nistry of supramolecular	assemblies		08-PCM5-141-m01		
Module	coord	inator		Module offered by			
lecture: kularer		seminar "Physikalische uren"	Chemie Supramole-	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
		xamines the basic intera of aggregates as well as			he formation and physical-cheministry.		
Intende	ed lear	ning outcomes					
in the f	ield. Tł		ation and physical-c		trating a high degree of expertise of aggregates. They can name mo-		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)			
S + Ü (r	no info	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		sessment (type, scope, langua	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
written (approx	exami	nation (approx. 90 minut		on of one candidate	each (approx. 20 minutes) or talk		
Allocat	ion of <sub>I</sub>	places					
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						
Master'	Master's degree (1 major) Chemistry (2014)						



Module title Abbreviation					Abbreviation		
Molecular Biology					08-BC-MOLM-141-m01		
Module coordinator Module offered by							
holder	of the	Chair of Biochemistry		Chair of Biochemis	stry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Durati	on	Module level	Other prerequisites				
1 seme	ester	undergraduate					
Conte	nts	,					
	ising a bioche		this module discusse	s advanced topics i	n molecular physiology and func-		
Intend	ed lear	ning outcomes					
Studer	nts have	e developed a sound kno	owledge of molecular	biology.			
Course	es (type, i	number of weekly contact hours,	language — if other than Ger	rman)			
V + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avai	lable)		
		sessment (type, scope, langu	age — if other than German,	examination offered — if no	ot every semester, information on whether		
didate 30 mir about	each (a nutes, g the me	approx. 20 minutes) or d	oral examination in ginutes) or d) presentassessment prior to the	groups of up to 3 can lition (approx. 30 min	or c) oral examination of one canndidates (groups of 2: approx. nutes). Students will be informed		
Alloca	tion of	places					
Additio	onal inf	ormation					
Workle	oad						
	1						
Teachi	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Modul	e appe	ars in					
appears							



Module title Abbreviation					Abbreviation
Molecular Biology Lab					08-BC-MOLP-141-m01
Modul	e coord	inator		Module offered b	py
holder	of the	Chair of Biochemistry		Chair of Biochem	nistry
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conter	ıts				
of mac	romole				engineering and characterisation ysis of biochemical processes, and
Intend	ed lear	ning outcomes			
Students have developed a knowledge of molecular biology and are able to apply it to practical experiments.					
Courses (type, number of weekly contact hours, language — if other than German)					
Ü (na i		tion on SWS (weekly con	tast baurs) and saurs		his)

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

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

a) written examination (approx. 60 to 90 minutes) or b) log (approx. 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or e) presentation (approx. 30 minutes). Students will be informed about the method and length of the assessment prior to the course.

Assessment offered: once a year, winter semester

Language of assessment: German, English

### Allocation of places

Biochemistry Bachelor's: 24 places. Chemistry Master's: 6 places.

#### **Additional information**

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#### Workload

--

#### **Teaching cycle**

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

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### Module appears in



Module title					Abbreviation
Practio	cal cour	se Molecular Machir	S	08-BC-VPMM-141-m01	
Module coordinator Module offered by					
holder	of the (	Chair of Biochemistry	J	Chair of Biochemis	stry
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade	o8-BC-MOLP		
Durati	on	Module level	Other prerequisites		
1 seme	ester	graduate			
Conte	nts		·		
in-prot	ein inte		ing, mutagenesis, proteir nd functional analysis of		rification, RNA-protein and prote- mplexes.
Studei work.	nts are a	able to explore a spe	cific research topic and d	eliver an oral prese	ntation on the results of their
Course	<b>es</b> (type, r	number of weekly contact h	ours, language — if other than Ge	rman)	
P (no i	nforma	tion on SWS (weekly	contact hours) and cours	e language availabl	e)
		<b>sessment</b> (type, scope, l	anguage — if other than German,	examination offered — if n	not every semester, information on whether
		o pages) and talk (a ssessment: German			
Alloca	tion of <sub> </sub>	places			
Additi	onal inf	ormation			
Additional information on module duration: block placement with a duration of a minimum of 40 working days.					
Workload					
<del>-</del>					

Teaching cycle

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 $\textbf{Referred to in LPO I} \ \ (\text{exam} \text{ination regulations for teaching-degree programmes})$ 

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Module appears in



Module	title	Abbreviation				
Practical course Protein Degradation in Eukaryotes for advanced students         08-BC-VPPD-141-m01						
Module	coordinator	у				
holder o	f the Chair of Biochemistry	C	hair of Biochem	istry		
ECTS	Method of grading	Only after succ. comp	l. of module(s)			
10	numerical grade	o8-BC-MOLP				
Duration	Module level	Other prerequisites				
1 semes	ter graduate					
Contents	<u> </u>					
This mod		portunity to explore a resea	rch topic in the	field of protein degradation in eu-		
Intended	l learning outcomes					
Students work.	s are able to explore a spec	ific research topic and deli	iver an oral pres	entation on the results of their		
Courses	(type, number of weekly contact ho	urs, language — if other than Germa	nn)			
P (no inf	ormation on SWS (weekly o	ontact hours) and course l	anguage availal	ole)		
	of assessment (type, scope, la reditable for bonus)	nguage — if other than German, exa	mination offered — if	not every semester, information on whether		
•	rox. 20 pages) and talk (ap e of assessment: German,					
Allocatio	on of places	,				
Addition	al information					
Addition	al information on module o	duration: block placement	with a duration o	of a minimum of 40 working days.		
Workloa	d					
Teaching	g cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appears in					



Module title Abbreviation					Abbreviation	
Practical course RNA Biochemistry for advanced students 08-BC-VPRB-141-mo1					08-BC-VPRB-141-m01	
Module coordinator Module o				Module offered by		
holder	of the	Chair of Biochemistry		Chair of Biochemis	stry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade	o8-BC-MOLP			
Duratio	on	Module level	Other prerequisites	i		
1 seme	ester	graduate				
Conter	nts					
mes as	s "mole vitro tra	cular machines", regulat nslation in different cell-	ory mechanisms of e		eld of RNA biochemistry. Riboso- osynthesis. Gradient centrifugati-	
Intend	ed lear	ning outcomes	_			
work.	They are th the h	e able to familiarise them	selves with different	mechanisms of gen	ntation on the results of their eral and specific translation con- appropriate and understandable	
Course	es (type, i	number of weekly contact hours,	language — if other than Ge	rman)		
P (no i	nforma	tion on SWS (weekly con	tact hours) and cours	e language availabl	e)	
		sessment (type, scope, langua ble for bonus)	age — if other than German,	examination offered — if n	ot every semester, information on whether	
		o pages) and talk (appro ssessment: German, Eng				
Alloca	tion of	places				
Additional information						
Additional information on module duration: block placement with a duration of a minimum of 40 working days.						
Worklo	oad					
	Facilities and					

Teaching cycle

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

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Module appears in



Module title Abbreviation						
Practical course Structural Biology for advanced students 08-BC-VPSB-141-mo1						
Module	e coord	inator		Module offered by		
holder	of the (	Chair of Biochemistry		Chair of Biochemis	try	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
10	nume	rical grade	o8-BC-MOLP			
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		,			
	damen	tal principles and technic			stallisation. It teaches students sation as well as crystallographic	
Intend	ed lear	ning outcomes				
					constructs for crystallisation. Il as data collection and proces-	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
	•	o pages) and talk (approssessment: German, Eng	=			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Additio	nal inf	ormation on module dura	ition: block placemer	nt with a duration of	a minimum of 40 working days.	
Workload						
Teaching cycle						
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		



Module	Module title Abbreviation						
Materi	al Scier	nces 2 (Materials)			08-FS2-141-m01		
Module coordinator				Module offered by			
Dean o	f Studie	es Funktionswerkstoffe (F	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	its						
This m	odule d	eals with the fabrication	and properties of the	main material grou	ps.		
Intend	ed learı	ning outcomes					
		e developed a knowledge knowledge to research pr		d properties of the n	nain material groups and are able		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V + Ü (ı	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		<b>eessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
30 min or d) lo and ler	utes) o g (appr ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	Workload						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						
	appears						



Module	Module title Abbreviation						
Chemic	ally ar	nd bio-inspired Nanotech	nology for Material S	ynthesis	08-NTM-141-m01		
Module coordinator				Module offered by			
holder of thesis	of the (	Chair of Chemical Techno	logy of Material Syn-	Chair of Chemical T	echnology of Material Synthesis		
ECTS	Meth	od of grading	Only after succ. con	ıpl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	undergraduate					
Conten	ts						
of analy	ysis us		nerated materials. It	also discusses the fu	stry and discusses the methods undamental principles of biomiynthesis.		
Intende	d lear	ning outcomes					
Studen	ts have	e developed an advanced	knowledge of sol-ge	l chemistry and bior	nineralisation.		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)			
V + V (n	o info	rmation on SWS (weekly o	contact hours) and co	urse language avail	able)		
		sessment (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether		
30 mini or d) lo	utes) o g (appi	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocati		•					
Additio	nal inf	ormation					
Worklo	ad						
Teachir	Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						
		ee (1 major) Chemistry (2	014)				



Module	Module title Abbreviation						
Molecular Materials (Lecture) 08-FMM-CT-141-mo1					08-FMM-CT-141-m01		
Module	coord	inator		Module offered by			
Dean o	f Studi	es Funktionswerkstoffe (F	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	numerical grade						
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate	-				
Conten	ts						
This mo	odule d	iscusses the theoretical	principles of molecul	ar and soft materials	5.		
Intende	ed lear	ning outcomes					
		e developed a knowledge ge to research problems.	of the principles of n	nolecular and soft m	aterials and are able to apply		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)			
V + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	urse language avail	able)		
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	et every semester, information on whether		
present	tation (	approx. 30 minutes) and	examination				
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	Workload						
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						
Master'	Master's degree (1 major) Chemistry (2014)						



Module title					Abbreviation
Polymer Chemistry					03-FU-PM1-141-m01
Module	e coord	inator		Module offered by	
holder of the Chair of Functional Materials in Medicine and Dentistry				Faculty of Medicine	
ECTS	Method of grading Only after succ. co			npl. of module(s)	
5	numerical grade				
Duration Module level		Other prerequisites			
1 semester graduate					
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 are familiar with the fundamentals of polymer chemistry and the related methods for their characterisation.

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.

- o3-FU-PM1-1-141: V (no information on SWS (weekly contact hours) and course language available)
- 03-FU-PM1-2-122: P (no information on SWS (weekly contact hours) and course language available)

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

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

### Assessment in module component 03-FU-PM1-1-141: Polymer Chemistry (Lecture)

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

#### Assessment in module component 03-FU-PM1-2-122: Polymer Chemistry (Practical course)

- 2 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each) and logs (approx. 5 pages each)

Assessment offered: once a year, summer semester					
Language of assessment: German, English if agreed upon with the examiner					
Allocation of places					
Additional information					
Workload					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					

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Module title	Module title Abbreviation					
Organo- and Biocatalysis 08-HKM1-141-mo1						
Module coord	linator		Module offered by			
lecturer of the seminar "Organo- and Biokatalyse"			Institute of Organic	Chemistry		
ECTS Meth						
5 nume	erical grade					
Duration Module level Other prerequis			ites			
1 semester	graduate					
Contents	•					
and applicati synthesis.	on areas. Biocatalysis: ef			chemistry, substance classes cts, especially regarding organic		
Intended lear	ning outcomes	•				
scribe the str				eas of application. They can de- able to mechanistically describe		
Courses (type,	number of weekly contact hours,	language — if other than Ger	man)			
S (no information on SWS (weekly contact hours) and course language available)						
<b>Method of as</b> module is credita		age — if other than German, o	examination offered — if no	t every semester, information on whether		
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course. Language of assessment: German, English						
Allocation of	places					
Additional information						
Workload						
Workload						
Workload 						
Workload  Teaching cyc	le					
	le					



Module title					Abbreviation	
Advan lysis	Advanced organometallic chemistry and its application in homogeneous cata- ysis					
Module coordinator Module offered by						
lecturer of the seminar "Spezielle Metallorganische Chemie and deren Anwendung in der Homogenkatalyse"				Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	numerical grade					
Durati	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conte	nts					
This m tions.	odule e	xamines elementary org	anic compounds of tr	ansition metals with	homogeneous catalytic applica-	
Intend	ed lear	ning outcomes				
		•		•	nentary organic compounds. They neous catalysis reactions.	
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Ger	rman)		
S (no i	nforma	tion on SWS (weekly con	tact hours) and cours	e language available	2)	
		<b>Sessment</b> (type, scope, langu le for bonus)	age — if other than German,	examination offered — if no	t every semester, information on whether	
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course. Language of assessment: German, English						
Alloca	tion of <sub> </sub>	olaces				
			_			
Additional information						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Modul	Module appears in					
***	Mantaula danua (, maiau) Chamietu (aa. , )					



Module title				Abbreviation		
Advan	Advanced transition metal chemistry 08-HKM4-141-mo1					
Module coordinator				Module offered by	Į.	
lecture	r of the	seminar "Spezielle Über	gangsmetallchemie"	Institute of Inorgan	ic Chemistry	
ECTS						
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conter	its					
nation	chemis				of transition metals and coordi- l discusses recent developments	
Intend	ed lear	ning outcomes				
		able to explain transition field. They can explain th			monstrating a high degree of exchemistry.	
Course	<b>S</b> (type, 1	number of weekly contact hours, I	anguage — if other than Ger	man)		
S (no i	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
<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) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course. Language of assessment: German, English						
Allocat						
Additional information						
Workload						
Teachi	Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)						



Module title					Abbreviation	
Pharmaceutical/Medicinal Chemistry 1					08-MCM2a-141-m01	
Module coordinator				Module offered by		
lecturers Pharmazeutische Chemie (Pharmaceutical Chemistry)			armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	numerical grade					
Duration Module level Other prerequisites			Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
structu in the r drug de	re-activ nodule evelopr	vity relationships; molecu; ; drug analysis; drug syn nent: discussion of speci	ılar effect mechanisn thesis; biotransforma	ns; pharmacological	gies for active agent discovery; principles of the drugs discussed tics of individual drugs; history of	
		ning outcomes				
		e developed a knowledge				
Course	<b>S</b> (type, r	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (no ir	V (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)						
30 min or d) lo	a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.					
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	Workload					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation	
Pharma	Pharmaceutical/Medicinal Chemistry 2				08-MCM2b-141-m01	
Module	e coord	inator		Module offered by		
lecture mistry)		mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i .		
1 seme	ster	graduate				
Conten	ts					
in the r drug de	nodule evelopr	; drug analysis; drug syn nent: discussion of spec	thesis; biotransform		principles of the drugs discussed tics of individual drugs; history of	
		ning outcomes				
		e developed a knowledge	•	· · · · · · · · · · · · · · · · · · ·		
	-	number of weekly contact hours, l			٠)	
		tion on SWS (weekly cont				
		le for bonus)	ige — ir otner than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo	utes) o g (appi	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 i	pprox. 30 minutes,	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
<del></del>						
Teaching cycle						
<del></del>						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
<del>-</del>						
Module appears in						
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation		
Bioorganic Chemistry 08-SCM3-141-mo1					08-SCM3-141-m01		
Modu	le coord	inator		Module offered by			
lecture Chemi		ture "Bioorganische Che	mie" (Bioorganic	Institute of Organio	c Chemistry		
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)			
5	nume	rical grade					
Durati	ion	Module level	Other prerequisites	i			
1 sem	ester	graduate					
Conte	nts						
lar inte	eraction				medicine. It focuses on molecu- , new aspects of DNA, RNA, prote-		
Intend	led lear	ning outcomes					
can ex can de	kplain the escribe l es (type, r	ne molecular diversity of modern aspects of DNA, number of weekly contact hours,	biological systems. T RNA, proteins and ca <sub>language</sub> — if other than Ge	hey can characterise rbohydrates. <sup>rman)</sup>	es of bioorganic chemistry. They the fabrication of agents. They		
		tion on SWS (weekly con					
		<b>sessment</b> (type, scope, langua ble for bonus)	age — if other than German,	examination offered — if n	ot every semester, information on whether		
30 min or d) lo and le	nutes) o og (app ength of	r c) oral examination in g	groups (groups of 2: a entation (approx. 30 c course.	pprox. 30 minutes,	re candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type		
Alloca	tion of	olaces					
Additi	onal inf	ormation					
Workload							
Teaching cycle							
<del></del>							
Referr	Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module appears in



Modul	Module title Abbreviation					
Theore	tical Ch	nemistry (Basics)		08-TCM1-141-m01		
Modul	e coord	inator		Module offered by		
lecture	r of lect	ture "Theoretische Chemi	ie"	Institute of Physica	l and Theoretical Chemistry	
ECTS	Metho	od of grading	Only after succ. con	ipl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conter	ıts		,			
This m	odule ir	ntroduces students to the	e fundamental princip	oles of theoretical ch	emistry.	
Intend	ed learı	ning outcomes				
		able to describe the math		al principles underly	ing the quantum chemical and	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
S + Ü (	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		sessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	et every semester, information on whether	
30 min or d) lo and ler	utes) o og (appr ogth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
	module appears in					



Module	Module title Abbreviation						
Compu	Computational Chemistry 08-TCM2-141-mo1						
Module	coord	inator		Module offered by	l.		
lecture	r of lect	ture "Computational Che	mistry"	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	ıpl. of module(s)			
5	numei	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
This mo	dule ir	ntroduces students to the	fundamental princip	oles of computationa	al chemistry.		
Intende	ed learr	ning outcomes					
Studen putatio			tical principles of co	mputational chemist	try and to apply methods in com-		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)			
S + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		<b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and len	utes) o g (appr igth of a	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	laces					
Additio	nal info	ormation					
Worklo	Workload						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
<del></del>							
Module	Module appears in						



		////	S MEXONEXALL C	J V, X. P. J	
Modul	e title				Abbreviation
Materi	al Scie	nces 1 (Principles)			08-FS1-141-m01
Modul	e coord	linator		Module offered by	
Dean o	f Studi	es Funktionswerkstoffe (I	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis
ECTS	Meth	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conter	its				
		discusses the fundamenta erties of materials.	al relations between o	themical bonding, th	ne structure, the microstructure
Intend	ed lear	ning outcomes			
	tructur				al bonding, the structure, the to apply them to research pro-
Course	S (type,	number of weekly contact hours, l	anguage — if other than Ger	man)	
V + Ü (	no info	rmation on SWS (weekly	contact hours) and co	urse language avail	able)
		<b>sessment</b> (type, scope, langua ole for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
30 min or d) lo and ler	utes) o g (app ngth of	or c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	oprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type
Allocat	ion of	places			
Additio	nal inf	ormation	,		
Workload					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module appears in



Module title					Abbreviation	
Supran	nolecu	lar Chemistry (Basic	s)		08-SCM1-102-m01	
Module	e coord	linator		Module offered by		
lecture	r of lec	ture "Organischen C	hemie"	Faculty of Chemist	Faculty of Chemistry and Pharmacy	
ECTS	Meth	od of grading	Only after succ. co	mpl. of module(s)		
5	nume	erical grade				
Duratio	on	Module level	Other prerequisite	25		
1 semester graduate						
Contents						
This module introduces students to the fundamental principles of supramolecular chemistry. It focuses on inter-						

Intended learning outcomes

dern applications of supramolecular chemistry.

Students are able to explain interactions between molecules demonstrating a high degree of expertise in the field as well as to describe the formation, structure and polymers of coordination compounds. They are able to describe the self-assembly of polymers in aqueous media as well as to identify the characteristics of synthetic ion channels. They can name modern applications of supramolecular chemistry.

actions between molecules, molecular recognition by receptors, complexes, supramolecular polymers, coordination polymers and networks, liquid crystals, self-assembly in aqueous media, synthetic ion channels and mo-

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

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

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

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

# **Allocation of places**

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#### **Additional information**

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#### Workload

--

# **Teaching cycle**

--

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

--

#### Module appears in

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Functional Materials (2012)



Module title Abbreviation						
Chemical Dynamics					08-PCM2-102-m01	
Module				Module offered by		
lecture mics)	r of sen	ninar "Chemische Dynar	nik" (Chemical Dyna-	Institute of Physica	l and Theoretical Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its		,			
					ical kinetics and reaction dyna- cribing chemical reactions.	
Intend	ed learı	ning outcomes				
		able to discuss advance dels for the investigatio			dynamics. They can describe me-	
Course	S (type, n	umber of weekly contact hours,	language — if other than Ger	man)		
S + Ü (ı	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
		·			ot every semester, information on whether	
module is	s creditab	le for bonus)				
		nation (90 minutes) or o ssessment: German or E		e candidate each (20	o minutes) or talk (30 minutes)	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
	_		_			
Worklo	ad					
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2010)					

Master's degree (1 major) Computational Mathematics (2012)



Module title					Abbreviation
Nanos	cale Ma	terials			08-PCM3-102-m01
Module	e coord	inator		Module offered by	
lecture	r of the	seminar "Nanoskalige N	Naterialien"	aterialien" Institute of Physical and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	Duration Module level		Other prerequisites		
1 seme	ster	graduate			
Conten	Contents				

This module discusses advanced topics in nanoscale materials. It focuses on the structure, properties, fabrication, modern characterisation methods and application areas of nanoscale materials.

## **Intended learning outcomes**

Students are able to characterise nanoscale materials. They are able to name analytical methods and application areas of nanoscale materials.

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

S + 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)

written examination (90 minutes) or oral examination of one candidate each (20 minutes) or talk (30 minutes) Language of assessment: German or English

#### Allocation of places

# **Additional information**

# Workload

## **Teaching cycle**

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

# Module appears in

Bachelor' degree (1 major) Nanostructure Technology (2010)

Bachelor' degree (1 major) Nanostructure Technology (2012)

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)

Master's degree (1 major) Functional Materials (2012)



Modul	Module title Abbreviation					
Clinica	Clinical and Analytical Chemistry				08-PH-KAC-092-m01	
Modul	Module coordinator Module offered by					
		ture "Klinisch-analytische   Chemistry)	e Chemie" (Clinical	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade	-			
Duration	on	Module level	Other prerequisites			
1 seme	ester	undergraduate				
Conter	nts					
This m	odule d	iscusses advanced topic	s in clinical analytica	l chemistry.		
Intend	ed lear	ning outcomes				
Studer	nts have	e developed an advanced	knowledge of molec	ular biology.		
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
V (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
			ge — if other than German,	examination offered — if no	t every semester, information on whether	
		le for bonus)				
	_	nation (120 minutes)				
Alloca	tion of p	olaces				
Additio	onal inf	ormation				
Worklo	oad					
	-					
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
<u></u>						
	Module appears in					
1	Master's degree (1 major) Biochemistry (2012)					
	Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2010)					
	_	ee (1 major) Chemistry (2 ee (1 major) Chemistry (2				
	master s degree (1 major) elicinistry (2014)					



Module	Module title Abbreviation					
Clinica	Clinical and Analytical Chemistry (practical course) 08-PH-KACP-092-m01					
Module	e coord	linator		Module offered by	L	
		ture "Klinisch-analytische l Chemistry)	e Chemie" (Clinical	Institute of Pharma	cy and Food Chemistry	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
5	(not)	successfully completed				
Duratio	n	Module level	Other prerequisites	1		
1 seme	ster	undergraduate				
Conten	ts					
This mo		covers practical topics in	clinical chemistry and	d clinical diagnostics	s as well as the related analytical	
Intende	ed lear	ning outcomes				
Studen ments.		e developed a knowledge	of clinical analytical	chemistry and are a	ble to apply it to practical experi-	
Course	<b>S</b> (type, i	number of weekly contact hours, I	anguage — if other than Ge	rman)		
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
		sessment (type, scope, langua	${\sf ge-if}$ other than German,	examination offered — if no	ot every semester, information on whether	
examin	ation t	alks (Testate, approx. 15	minutes each), log (a	approx. 5 to 10 pages	5)	
Allocat	ion of	places				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	le				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in						
Master's degree (1 major) Biochemistry (2012)						
Master	Master's degree (1 major) Chemistry (2013)					
	Master's degree (1 major) Chemistry (2010)					
Master	Master's degree (1 major) Chemistry (2014)					



Module	Module title Abbreviation					
Lab Co	urse M	aterials Science			08-FMM-MP-102-m01	
Module	e coord	linator		Module offered by		
lecture ctional	•	cialisation subject Funktio ials)	onsmaterialien (Fun-	Chair of Chemical T	echnology of Material Synthesis	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its					
Ten sel	ected (	experiments in materials	science.			
Intend	ed lear	ning outcomes				
Studen	its hav	e developed an advanced	proficiency in the pe	erformance of experi	ments in materials science.	
Course	<b>S</b> (type, i	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	t every semester, information on whether	
cal per	forman	re-experiment exams) and ice, log (5 to 10 pages) assessment: German or Ei	,	xperiment exams) (1	5 minutes), assessment of practi-	
Allocat	ion of	places				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	le				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in						
	Master's degree (1 major) Chemistry (2013)					
	Master's degree (1 major) Chemistry (2010)					
Master	Master's degree (1 major) Chemistry (2014)					



Module	Module title Abbreviation					
Project	Work				08-FMM-PA-102-m01	
Module	e coord	inator		Module offered by		
head o	f the re	search group offering the	e module	Chair of Chemical T	echnology of Material Synthesis	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate	-			
Conten	its					
		ives students the opport findings.	unity to explore a res	earch topic under th	e guidance of a supervisor and to	
Intend	ed lear	ning outcomes				
Studen	its have	e developed an advanced	proficiency in the pe	erformance of experi	ments in materials science.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		sessment (type, scope, langua	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		15 minutes) and log (appr ssessment: German or E				
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
-						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
-	-					
Module	Module appears in					
	Master's degree (1 major) Chemistry (2013)					
	Master's degree (1 major) Chemistry (2010)					
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation	
Practic	al cour	se medicinal chemistry			08-MCM1-102-m01	
Module	Module coordinator			Module offered by		
lecture mistry)		mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	(not)	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate	-			
Conten	ts					
Selecte	ed meth	nods and topics in medic	inal chemistry (synth	esis, testing, analysi	is, theory, pharmacokinetics).	
Intende	ed lear	ning outcomes				
Studen	ts have	e developed a knowledge	of medicinal chemis	try and are able to a	pply it to practical experiments.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)		
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
wodule is Vortest of prac	creditab ate (pr	e-experiment exams) and erformance, written repor	l Nachtestate (post-e t (approx. 30 to 50 pa	xperiment exams) (a	ot every semester, information on whether approx. 20 minutes), assessment	
		ssessment: German or E	nglish			
Allocat	ion of p	olaces				
 A J J!4! -						
Additio	nat inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in						
	Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2010)					
	Master's degree (1 major) Chemistry (2010) Master's degree (1 major) Chemistry (2014)					
	Master's degree (1 major) FOKUS Pharmacy (2012)					



Module	Module title Abbreviation						
Supran	nolecul	ar Chemistry (Practical C	ourse)		08-SCM2-102-m01		
Module coordinator				Module offered by	I.		
		ture "Supramolekularen ( kalische Chemie)"	Chemie (Organische	Faculty of Chemistr	y and Pharmacy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its						
mistry.	They w		host-guest complexe		ents in supramolecular che- nd nanoparticles and use advan-		
Intende	ed learı	ning outcomes					
		able to perform syntheses hem. They are able to pro			roscopic methods to analyse and hem microscopically.		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ge	rman)			
P (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
		, logs (approx. 5 pages e ssessment: German or E					
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
 Worklo	ad						
Teachi	ng cvcl						
	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						
Master	Master's degree (1 major) Chemistry (2013)						
	Master's degree (1 major) Chemistry (2010)						
Master	Master's degree (1 major) Chemistry (2014)						



Module title					Abbreviation		
Progra	mming	in Theoretical Chemi	stry		08-TCM3-102-m01		
Module coordinator				Module offered by			
lecture mie"	er of lec	ture "Programmieren	in Theoretischer Che-	Institute of Physica	al and Theoretical Chemistry		
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites	i			
1 seme	ester	graduate					
Conter	nts	, C	<b>,</b>				
		provides an introduction	on to the fundamentals	of programming in tl	neoretical chemistry and discus-		
Intend	ed lear	ning outcomes					
		able to explain and us		ng languages typica	lly used in theoretical chemistry		
Course	<b>es</b> (type, r	number of weekly contact ho	urs, language — if other than Ge	rman)			
S + Ü (	no info	rmation on SWS (wee	kly contact hours) and c	ourse language avai	lable)		
		sessment (type, scope, la	nguage — if other than German,	examination offered — if n	ot every semester, information on whether		
		nd discussion of appro essessment: German c	ox. 5 programming exerc or English	ises as well as talk	(approx. 45 minutes)		
Allocat	tion of p	places					
	-						
Additio	onal inf	ormation					
Worklo	nad						
Teachi	ng cycl	<b>e</b>					
	<u>5</u> - y - t						
Doforre	ad to in	IPO I (ovamination re-	ations for toaching dagger	ammos)			
Kelelle	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Modul	Module appears in						
	Module appears in Master's degree (4 major) Chemistry (2012)						
	Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2010)						
	Master's degree (1 major) Chemistry (2014)						
	Naster's degree (1 major) Chemistry (2014) Naster's degree (1 major) Mathematics (2012)						
	_						
	laster's degree (1 major) Mathematics (2010)						

Master's degree (1 major) Computational Mathematics (2012)



Module title Abbreviation				Abbreviation		
Polymers II					03-PM2-122-m01	
Module coordinator				Module offered by		
holder Dentist		Chair of Functional Mater	ials in Medicine and	Faculty of Medicine	3	
ECTS	Metho	od of grading	Only after succ. con	ıpl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
group a graphie	nalysi: es, poly	s, mass spectrometry) - c vmer functionalisation).			meation chromatography, end- block-copolymers, polymer topo-	
		ning outcomes		. 1.0	1.1	
		uire an advanced knowle			nd characterisation.	
		number of weekly contact hours, l				
		rmation on SWS (weekly	· · · · · · · · · · · · · · · · · · ·		·	
		<b>Sessment</b> (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
a) writt (30 mir	en exa			ination of one candi	idate each (20 minutes) or c) talk	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master's degree (1 major) Chemistry (2013)						
	Mantagla diamage (consistent (consistent (consistent)					

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Functional Materials (2012)

Master's degree (1 major) Technology of Functional Materials (2010)



Modul	Module title Abbreviation					
Laser S	Spectro	scopy			08-PCM1a-132-m01	
Modul	e coord	inator		Module offered by	L	
lecture copy)	er of ser	ninar "Laserspektroskopi	e" (Laser Spectros-	Institute of Physica	l and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts					
		ntroduces students to the spectroscopy.	e fundamental princip	oles of laser spectro	scopy. It discusses absorption	
Intend	ed lear	ning outcomes				
		able to explain the compo ology. They are able to de			as well as the optical principles emission spectroscopy.	
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)		
S + Ü (	no info	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
		nation (90 minutes) or or ssessment: German or E	•	ninutes)		
Allocat	tion of <sub> </sub>	places				
Additio	onal inf	ormation				
Worklo	oad					
-						
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Modul	Module appears in					
	Master's degree (1 major) Chemistry (2013)					
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation	
Advanced Physical Chemistry (Lab)					o8-PCM1b-132-mo1	
Module	e coord	linator		Module offered by	I.	
lecture copy)	r of ser	minar "Laserspektroskopi	e" (Laser Spectros-	Institute of Physica	ll and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conten	its					
borato	ry. Afte		idents autonomously	conduct experimen	ds in physical chemistry in the la- its in the laboratory. Students will	
Intend	ed lear	ning outcomes				
		e developed a high level of to analyse the resulting r			ethods in physical chemistry.	
Course	<b>S</b> (type,	number of weekly contact hours, I	anguage — if other than Ge	rman)		
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
		sessment (type, scope, langua ble for bonus)	${\sf ge-if}$ other than German,	examination offered — if no	ot every semester, information on whether	
prox. 1	5 page:	•	·	xperiment exams) (a	approx. 15 minutes) and log (ap-	
Allocat	ion of	places				
Additio	nal inf	ormation				
Additional information on module duration: block placement with a duration of a minimum of 20 working days.						
Workload						
Teaching cycle						
	f 1/ 1001					

Module appears in

Master's degree (1 major) Chemistry (2013)

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



Module	Module title Abbreviation						
Physical Chemistry (Advanced Lab) 08-PCM6-132-mo1							
Module	coord	inator		Module offered by			
lecture	rs Phys	ikalische Chemie (Physic	al Chemistry)	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed	o8-PCM1				
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
		ives students the opport f Physical Chemistry and			f the research groups based at lytical methods.		
Intende	ed lear	ning outcomes					
					relevant physical chemistry rese- questions in physical chemistry.		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)			
P (no in	format	tion on SWS (weekly cont	act hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
		(approx. 20 minutes) ssessment: German or E	nglish				
Allocat	ion of <sub>I</sub>	places					
Additio	nal inf	ormation					
Additio	nal inf	ormation on module dura	tion: block placemer	nt with a duration of	a minimum of 20 working days.		
Worklo	ad						
Teaching cycle							
<del></del>							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						



Module	Module title Abbreviation					
Princip	les of o	drug design			o8-MCM3-132-mo1	
Module	Module coordinator			Module offered by	I.	
lecture mistry)		mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ıts					
cophor QSAR. gies, b	re mode Predict ioisoste	els, docking, virtual scree ions of pharmacokinetic erism, SAR.	ning, simulation met	hods, de novo desig	ure-based drug design, pharmagn. Ligand-based drug design. ase examples, prodrug strate-	
	-	ning outcomes				
		ter the theoretical and ex		,	g design.	
		number of weekly contact hours, l				
		rmation on SWS (weekly	•			
		<b>sessment</b> (type, scope, langua <sub>l</sub> le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
		with discussion (approx. ssessment: German or E				
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
	_					
Worklo	ad					
Teachi	Teaching cycle					
<del></del>						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
	Module appears in					
	Master's degree (1 major) Chemistry (2013)					
Master	Master's degree (1 major) Chemistry (2014)					



		W. 49. 24.182		, , , , , , ,		
Module	title			Abbreviation		
Practical course Homogeneous catalysis in Inorganic Chemi				istry	08-HKM3AC-132-m01	
Module	coord	inator		Module offered by		
		seminar "Spezielle Meta vendung in der Homoger		Institute of Inorgan	ic Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
thods i and cry	n homo stallog	geneous catalysis. The f	ocus will be on cataly expected to conduct t	st synthesis and ch	synthesis and analytical me- aracterisation, spectral analysis independently, write a lab report	
Intende	ed learr	ning outcomes				
					eneous catalysis in the lab and to dings and deliver a presentation.	
Course	<b>S</b> (type, n	umber of weekly contact hours,	anguage — if other than Ger	rman)		
P (no ir	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)	
		essment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		with lab report (approx. ssessment: German or E		pprox. 15 minutes)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Additio	nal info	ormation on module dura	ation: block placemer	nt with a duration of	a minimum of 20 working days.	
Worklo	ad					
Teaching cycle						
<del></del>						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					



		WAS ALL				
Modul	Module title				Abbreviation	
Practical course Homogeneous catalysis in Organic Chemis				stry	08-HKM3OC-132-m01	
Module	e coord	inator		Module offered by		
		seminar "Spezielle Meta vendung in der Homoger		Institute of Organic	Chemistry	
ECTS	Metho	od of grading	Only after succ. con	ipl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its					
thods i and cry docum	n homo stallog enting	ogeneous catalysis. The f raphy. Students will be e their findings and delive	ocus will be on cataly expected to conduct t	st synthesis and ch	synthesis and analytical me- aracterisation, spectral analysis independently, write a lab report	
Intend	ed lear	ning outcomes				
					eneous catalysis in the lab and to dings and deliver a presentation.	
Course	<b>!S</b> (type, r	number of weekly contact hours,	language — if other than Ger	man)		
P (no ir	nformat	ion on SWS (weekly cont	tact hours) and cours	e language available	<u>e)</u>	
		sessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		with lab report (approx. ssessment: German or E		pprox. 15 minutes)		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Additio	nal info	ormation on module dura	ation: block placemer	nt with a duration of	a minimum of 20 working days.	
Worklo	ad					
Teaching cycle						
<del>-</del>						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
<del></del>						
Module	Module appears in					



Module	Module title Abbreviation						
Theoret	Theoretical Chemistry - Project course wave-packet dynamics 08-TCAP1-132-m01						
Module coordinator Module offered b					Į.		
head of	the re	search group offering the	e module	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	ipl. of module(s)			
5	(not) s	successfully completed	-				
Duratio	n	Module level	Other prerequisites				
1 semes	ster	graduate	-				
Conten	ts						
the Inst	itute o				f the research groups based at seed in the discipline. The focus		
Intende	d learr	ning outcomes					
		learned some of the me			stry and, in particular, in wave f wave packet dynamics.		
Courses	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
P (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	e)		
		eessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
		approx. 30 minutes) ssessment: German or E	nglish				
Allocati	ion of p	olaces					
Additio	nal info	ormation					
Additio	nal info	ormation on module dura	tion: 4 weeks.				
Workload							
Teaching cycle							
-							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
<del></del>							
Module	Module appears in						



Modul	Module title Abbreviation							
Theoretical Chemistry - Project coursewave function based methods								
ineore	tical Cr	iemistry - Project course	metnoas	08-TCAP2-132-m01				
Modul	e coord	inator		Module offered by				
head o	f the re	search group offering the	e module	Institute of Physica	l and Theoretical Chemistry			
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)				
5	(not) s	successfully completed						
Duratio	on	Module level	Other prerequisites					
1 seme	ster	graduate						
Conten	its							
the Ins	titute o				f the research groups based at seed in the discipline. The focus			
Intend	ed learr	ning outcomes						
					stry and, in particular, in wave of wave function methods.			
Course	<b>S</b> (type, n	number of weekly contact hours,	anguage — if other than Ger	rman)				
P (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)			
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether			
		approx. 30 minutes) ssessment: German or E	nglish					
Allocat	ion of p	olaces						
Additic	nal info	ormation						
Additional information on module duration: 4 weeks.								
Workload								
<u></u>								
Teaching cycle								
Referred to in LPO I (examination regulations for teaching-degree programmes)								

Master's degree (1 major) Chemistry (2013)

Module appears in



Modu	le title	Abbreviation				
Theor	etical C	08-TCAP3-132-m01				
Modu	Module coordinator				d by	
head	of the re	esearch group offering the	e module	Institute of Phy	sical and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. com	pl. of module(s	s)	
5	(not)	successfully completed				
Durati	ion	Module level	Other prerequisites			
1 sem	ester	graduate				
Conte	nts					
the In	stitute d				ne of the research groups based at ally used in the discipline. The focus	
Intend	ded lear	ning outcomes				
					nemistry and, in particular, in theoretifield of theoretical photochemistry.	
Cours	<b>es</b> (type,	number of weekly contact hours,	language — if other than Ger	man)		
P (no	informa	tion on SWS (weekly cont	tact hours) and course	e language avai	lable)	
		<b>sessment</b> (type, scope, languable for bonus)	age — if other than German, e	examination offered	— if not every semester, information on whether	
		(approx. 30 minutes) assessment: German or E	nglish			
Alloca	tion of	places				
		-				
Additi	ional in	formation				
Additi	onal in	formation on module dura	ation: 4 weeks.			
Workl	oad					
Teach	Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
	Master's degree (1 major) Chemistry (2013)					
Maste	Master's degree (1 major) Chemistry (2014)					



# Other additional qualifications

(10 ECTS credits)



Module	Module title Abbreviation						
Tutorin	Tutoring 1 (practical course)				08-WRM1-132-m01		
Module	coord	inator		Module offered by			
Dean o	f Studi	es Chemie (Chemistry)		Faculty of Chemistr	y and Pharmacy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate	module is not permi		arch assistant contract for this ust accompany a different course M2.		
Conten	ts						
		ives students the opport I Pharmacy and learn how			lecture offered by the Faculty of an appropriate manner.		
Intende	ed lear	ning outcomes					
Studen needs.	ts are a	able to teach students in	earlier stages of thei	r degrees and tailor t	their teaching to those students'		
Course	<b>S</b> (type, r	number of weekly contact hours, I	anguage — if other than Ger	rman)			
Ü (no ir	nforma	tion on SWS (weekly con	tact hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
		f materials for demonstra ssessment: German or E		approx. 120 hours to	otal)		
Allocat	ion of <sub>l</sub>	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
<del></del>							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
	Module appears in						
	Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2014)						



Module	Module title Abbreviation						
Tutoring 2 (practical course)					08-WRM2-132-m01		
Module	e coord	inator		Module offered by			
Dean o	f Studie	es Chemie (Chemistry)		Faculty of Chemistr	y and Pharmacy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not) s	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate	module is not permi		arch assistant contract for this uust accompany a different course M1.		
Conten	its		•				
					lecture offered by the Faculty of an appropriate manner.		
Intende	ed learr	ning outcomes					
Studen needs.	its are a	able to teach students in	earlier stages of thei	r degrees and tailor	their teaching to those students'		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)			
Ü (no ir	nformat	tion on SWS (weekly con	tact hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
		materials for demonstra ssessment: German or E		approx. 120 hours to	otal)		
Allocat	ion of p	olaces					
Additio	nal info	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						
	Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2014)						



Module	Module title Abbreviation						
Foreign Studies (short)					08-APM1-132-m01		
Module coordinator				Module offered	by		
Erasmu	s prog	ramme coordinator Chen	nie (Chemistry)	Faculty of Chem	istry and Pharmacy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed					
Duratio	n	Module level	Other prerequisites				
1 semester graduate			Admission prerequisite to assessment: regular attendance of placement (a maximum of 2 incidents of absence); consultation with course advisory service prior to placement highly recommended; not to be combined with o8-APM2.				
Conten	ts						
change course	progra offered	ammes such as Erasmus	etc. The contents of t	he course should	plete this course in the context of ex- d correspond to the contents of a lab CTS credits); please consult with the		
Intende	ed lear	ning outcomes					
		familiar with procedures I subject-specific skills a			countries other than Germany. They skills.		
Course	<b>S</b> (type, r	number of weekly contact hours,	anguage — if other than Ge	rman)			
P (no in	format	tion on SWS (weekly cont	act hours) and cours	e language avail	able)		
<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)							
report (2 pages); proof of having completed lab course Language of assessment: German or English; language of the respective placement country where required							
Allocation of places							
Additional information							

Additional information on module duration: block placement abroad with a duration of a minimum of 20 working days.

# Workload

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# **Teaching cycle**

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# $\textbf{Referred to in LPO I} \ \ (\text{examination regulations for teaching-degree programmes})$

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# Module appears in

Master's degree (1 major) Chemistry (2013)



Module	e title				Abbreviation	
Foreigr	1 Studi	es (long)			08-APM2-132-m01	
Module	e coord	inator		Module offered	l by	
Erasmu	ıs prog	ramme coordinator Chem	nie (Chemistry)	Faculty of Chen	nistry and Pharmacy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s	)	
10	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
2 semester graduate			Admission prerequisite to assessment: regular attendance of placement (a maximum of 2 incidents of absence); consultation with course advisory service prior to placement highly recommended; not to be combined with o8-APM1.			
Conten	its					
change course	e progra offered	ammes such as Erasmus	etc. The contents of t	he course shoul	olete this course in the context of exd correspond to the contents of a lab ECTS credits); please consult with the	
Intend	ed lear	ning outcomes				
		familiar with procedures I subject-specific skills a			countries other than Germany. They skills.	
Course	<b>S</b> (type, 1	number of weekly contact hours,	language — if other than Ge	rman)		
P (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)						
report (2 pages); proof of having completed lab course Language of assessment: German or English; language of the respective placement country where required						
Allocat	ion of	places				

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## **Additional information**

Additional information on module duration: block placement abroad with a duration of a minimum of 40 working days.

# Workload

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# **Teaching cycle**

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 $\textbf{Referred to in LPO I} \ \ (\text{examination regulations for teaching-degree programmes})$ 

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# Module appears in



Modul	e title	,	Abbreviation			
Chemi	stry-rel	lated courses outside of t		08-CHPM1-141-m01		
Modul	e coord	linator		Module offered by		
Dean c	f Studi	es Chemie (Chemistry)		Faculty of Chemistr	y and Pharmacy	
ECTS	Meth	od of grading	Only after succ. con	ıpl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate	Please consult with	course advisory sen	vice.	
Conter	ıts	,	•			
other F	acultie		cluded in the acaden		elated courses that are offered by eir programmes. Students MUST	
Intend	ed lear	ning outcomes				
Studer	its hav	e developed the knowled	ge and skills taught i	n the courses attend	led by them.	
Course	S (type,	number of weekly contact hours, I	anguage — if other than Ger	man)		
A (no i	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	<u>e</u> )	
		sessment (type, scope, langua	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		or successful completion assessment: German, Eng		turer		
Allocat	ion of	places				
Additio	onal inf	formation				
Worklo	ad					
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Modul	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



Modul	Module title Abbreviation					
Chemistry-related courses within the Natural Sciences					08-CHPM2-141-m01	
Modul	e coord	linator		Module offered by		
Dean c	of Studi	es Chemie (Chemistry)		Faculty of Chemistr	y and Pharmacy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate	Please consult with	course advisory ser	vice.	
Conter	nts	,	•			
other F	acultie		cluded in the acaden		elated courses that are offered by neir programmes. Students MUST	
Intend	ed lear	ning outcomes				
Studer	nts hav	e developed the knowled	ge and skills taught i	n the courses attenc	led by them.	
Course	es (type,	number of weekly contact hours, l	anguage — if other than Ger	man)		
A (no i	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
		sessment (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		or successful completion assessment: German, Eng		turer		
Alloca	tion of	places				
Additio	onal inf	ormation				
Worklo	oad					
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Modul	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



# **Compulsory Courses (double degree)**

(5 ECTS credits)



Module title				Abbreviation		
Toxicology and legal studies					03-TR-072-m01	
Module	Module coordinator				Module offered by	
lecture	lecturer of lecture "Toxikologie und Rechtskunde"			Faculty of Medicine		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
3	3 numerical grade					
Duration Module level			Other prerequisites			
1 semester undergraduate						
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** (type, number of weekly contact hours, language — if other than German)

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

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

written examination (approx. 90 minutes)

#### Allocation of places

#### **Additional information**

# Workload

# **Teaching cycle**

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

#### Module appears in

Bachelor' degree (1 major) Biochemistry (2011)

Bachelor' degree (1 major) Biochemistry (2013)

Bachelor' degree (1 major) Biochemistry (2009)

Bachelor' degree (1 major) Chemistry (2007)

Bachelor' degree (1 major) Chemistry (2008)

Bachelor' degree (1 major) Chemistry (2010)

Bachelor' degree (1 major) Chemistry (2009)

Bachelor' degree (1 major) Food Chemistry (2009)

Bachelor' degree (1 major) FOKUS Chemistry (2011)

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

First state examination for the teaching degree Grundschule Chemistry (2009)

First state examination for the teaching degree Hauptschule Chemistry (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 Mittelschule Chemistry (2013)



Modul	Module title Abbreviation					
Advanced chemical practical course 08-VPN					08-VPM-DA-132-m01	
Modul	e coord	inator		Module offered by		
head o	f the re	search group offering the	e module	Faculty of Chemistr	y and Pharmacy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
2	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts					
		ives students the opport ne in question.	unity to explore a res	earch topic and app	ly the methods commonly used	
Intend	ed lear	ning outcomes				
	nts are a esentat		research topic and p	resent the results of	their work in a written report or	
Course	<b>es</b> (type, r	number of weekly contact hours, I	anguage — if other than Ger	rman)		
P (no ii	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
		(approx. 3 pages) ssessment: German, Eng	dish			
Allocat	tion of p	olaces				
Additio	onal inf	ormation				
Worklo	oad					
Teachi	Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
	Master's degree (1 major) Chemistry (2013)					
Master	Master's degree (1 major) Chemistry (2014)					



# **Compulsory Electives (double degree)**

(55 ECTS credits)

Students must choose two focuses (focus 1 with 30 ECTS credits, focus 2 with 25 ECTS credits).



# **Inorganic Chemistry**

(25 ECTS credits)



# **Compulsory Courses**

(20 ECTS credits)



Module title Abbreviation						
Advanced Inorganic Chemistry 08-ACM1-141-mo1						
Module coordinator Module offered by						
Manag	ing Dir	ector of the Institute of	Inorganic Chemistry	Institute of Inorgar	nic Chemistry	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
10	nume	rical grade				
<u> </u>		Other prerequisites	<b>.</b>			
2 semester graduate -						
Conter	nts					
specia	l comp		p elements (MGEs), bo		metal chemistry. It focuses on MGEs and MGE compounds, the	
Intend	ed lear	ning outcomes				
the che	emical rdinatio	properties of transition on compounds.	metals and analyse th	e structure as well a	roup elements. They can describe s chemical and physical aspects	
	_	number of weekly contact hours				
		rmation on SWS (weekly	·		·	
		<b>sessment</b> (type, scope, lang ble for bonus)	uage — if other than German,	examination offered — if n	ot every semester, information on whether	
30 min or d) lo and le	utes) o og (app ngth of	or c) oral examination in	groups (groups of 2: a sentation (approx. 30 i e course.	pprox. 30 minutes,	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	tion of	places				
Additio	onal inf	ormation				
Worklo	oad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		

Module appears in



Modul	Module title Abbreviation						
Inorganic Chemistry practical course for advanced 08-ACPM-132-mo1							
Modul	e coord	inator		Module offered b	y		
focus point coordinator "Inorganic Chemistry"			mistry"	Institute of Inorga	nic Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
10	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conter	its						
thods i tral an	n inorg alysis a	anic chemistry. The focus	s will be on working ι ents will be expected	under inert atmosp I to conduct their w	d synthesis and analytical me- heres, purification methods, spec- rork in the lab independently, write		
Intend	ed lear	ning outcomes					
					anic chemistry in the lab and to indings and deliver a presentation.		
	<b>S</b> (type, r	number of weekly contact hours, I	anguage — if other than Ge	rman)			
Course		P (no information on SWS (weekly contact hours) and course language available)					

### **Allocation of places**

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#### **Additional information**

Additional information on module duration: block placement with a duration of a minimum of 40 working days.

# Workload

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### **Teaching cycle**

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 $\textbf{Referred to in LPO I} \ \ (\text{examination regulations for teaching-degree programmes})$ 

practical work with lab report (approx. 20 pages) and talk (approx. 15 minutes)

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# Module appears in

Master's degree (1 major) Chemistry (2013)

Language of assessment: German or English



# **Compulsory Electives**

(ECTS credits)



Module	e title				Abbreviation	
Bioano	rganic	Chemistry		08-ACM2-141-m01		
Module	Module coordinator Module offered by					
and Me	edizinis	minar "Anorganische Aspo schen Chemie" (Inorganic edicinal Chemistry)		Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. compl. of module(s)			
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conten	its					
	ds of BI				chemistry (BIC). It discusses the ns of BIC in the fields of diagnosis	
Intend	ed lear	ning outcomes				
		able to describe the princus enzymes and describe			xplain the structure and effects medicine.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ge	rman)		
S (no ii	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		sessment (type, scope, langua	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and ler	utes) o g (app ngth of	r c) oral examination in g	roups (groups of 2: a ntation (approx. 30 r ourse.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Allocat	ion of <sub> </sub>	olaces				
	.,					
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	nmmes)		
Module	e appea	ars in				
Master	's degr	ee (1 major) Chemistry (2	014)			



Module title					Abbreviation	
Solid state chemistry and inorganic materials 08-ACM3-141-mo1					o8-ACM3-141-mo1	
Module	Module coordinator Module offered by					
lecturer of seminar "Festkörperchemie and Anorganisch Materialien" (Solid State Chemistry and Inorganic Materials)				Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. con	after succ. compl. of module(s)		
5	nume	rical grade				
Duration Module level Other prerequisites						
1 seme	ster	graduate				
Conten	ts					
		rovides an introduction t nthesis methods and sel			structure, chemical and physical	
Intende	ed lear	ning outcomes				
					plain methods for solid-state the corresponding solids.	
Course	<b>S</b> (type, i	number of weekly contact hours,	language — if other than Ger	man)		
S (no ir	nforma	tion on SWS (weekly cont	tact hours) and cours	e language available	e)	
		sessment (type, scope, langua ole for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and ler	utes) o g (app ngth of	r c) oral examination in g	groups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Allocat	-	-	<u>,</u>			
Additio	nal inf	ormation	_			
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
Module	e appea	ars in				
Master	's degr	ee (1 major) Chemistry (2	014)			



Modul	e title		Abbreviation			
Advan- lysis	ced org	anometallic chemistry a	nomogeneous cata-	08-HKM2-141-m01		
Module coordinator Module offered by						
lecturer of the seminar "Spezielle Metallorganisch and deren Anwendung in der Homogenkatalyse"				Institute of Inorgan	ic Chemistry	
ECTS	S Method of grading Only after succ. compl. of module(s)					
5	nume	rical grade				
Durati	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conte	nts					
This m tions.	odule e	xamines elementary org	anic compounds of tr	ansition metals with	homogeneous catalytic applica-	
Intend	ed lear	ning outcomes				
		•		•	nentary organic compounds. They neous catalysis reactions.	
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Ger	man)		
S (no i	nforma	tion on SWS (weekly con	tact hours) and cours	e language available	2)	
		<b>Sessment</b> (type, scope, langu	age — if other than German,	examination offered — if no	ot every semester, information on whether	
30 mir or d) lo and le	nutes) o og (appi ngth of	r c) oral examination in §	groups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Alloca	tion of <sub> </sub>	places				
			_			
Additio	onal inf	ormation				
Workle	oad					
Teachi	ing cycl	e	-			
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	ımmes)		
			00 1000	,		
Modul	e appea	ars in				
	Module appears in					



Module	Module title Abbreviation						
Compu	Computational Chemistry 08-TCM2-141-m01						
Module	Module coordinator Module offered by						
lecture	r of lect	ture "Computational Che	mistry"	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its		,				
This m	odule ir	ntroduces students to the	e fundamental princip	oles of computationa	al chemistry.		
Intend	ed learı	ning outcomes					
		able to explain the theore	etical principles of co	mputational chemist	try and to apply methods in com-		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S + Ü (ı	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		sessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	et every semester, information on whether		
30 min or d) lo and ler	utes) o g (appr ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
	- •						
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			
		, , , , , , , , , , , , , , , , , , , ,	3 - 0 - 1 - 1	,			
Module	Module appears in						
	means appears						



Modul	Module title Abbreviation					
Advan	Advanced NMR- and Mass Spectrometry 08-OCM-NMRMS-141-mo1					
Module coordinator Module				Module offered by		
lab course supervisor Institute of Organic Chemis			Chemistry			
ECTS	Metho	od of grading	Only after succ. compl. of module(s)			
5	nume	rical grade				
Duration Module level Other prerequisites						
1 seme	ester	graduate				
Conter	ıts					
sights	into the		the two measuring to	echniques and inclu	pectrometry. It offers deeper indes exercises that give students meter.	
Intend	ed lear	ning outcomes				
		able to discuss NMR and to experiment with both			n degree of expertise in the field.	
Course	es (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
P (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
Metho	d of ass	sessment (type, scope, langua	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		le for bonus)	,			
30 min or d) lo and lei	utes) o og (appi ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	tion of p	places				
Additio	onal inf	ormation				
Worklo	oad					
Teachi	ng cycl	e				

Module appears in

Master's degree (1 major) Chemistry (2014)

 $\textbf{Referred to in LPO I} \ \ (\text{examination regulations for teaching-degree programmes})$ 

# **Organic Chemistry**

(25 ECTS credits)



# **Compulsory Courses**

(15 ECTS credits)



Modul	Module title Abbreviation					
Modern Synthetic Methods					08-OCM-SYNT-141-m01	
Modul	e coord	inator		Module offered by		
lecture	r of the	seminar		Institute of Organic	Chemistry	
ECTS	Meth	od of grading	Only after succ. con	ıpl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conter	its					
		liscusses modern stereosemistry and catalysis.	selective synthesis m	ethods. It focuses o	n selected total syntheses, orga-	
Intend	ed lear	ning outcomes				
They ca		ain total syntheses. They			stereochemically analyse them. chemistry and catalysis in synthe-	
Course	<b>S</b> (type, r	number of weekly contact hours,	anguage — if other than Ger	man)		
S + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avai	lable)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if n	ot every semester, information on whether	
30 min or d) lo and ler	utes) o g (app ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes,	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of <sub> </sub>	olaces				
Additio	nal inf	ormation				
Worklo	ad					

Teaching cycle

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

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Module appears in



Module title Abbreviation						
Advanced NMR- and Mass Spectrometry 08-OCM-NMRMS-141-mo1						
Module coordinator Module offered by						
lab course supervisor 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						
This module equips students with an advanced knowledge of NMR and mass spectrometry. It offers deeper insights into the theoretical principles of the two measuring techniques and includes exercises that give students the opportunity to learn how to evaluate complicated spectra and use a spectrometer.						
Intended learning outcomes						
Students are able to discuss NMR and They are able to experiment with both s						
Courses (type, number of weekly contact hours, I	anguage — if other than Ger	man)				
P (no information on SWS (weekly cont	act hours) and cours	e language available	e)			
<b>Method of assessment</b> (type, scope, langua module is creditable for bonus)	ge $-$ if other than German, $\epsilon$	examination offered — if no	ot every semester, information on whether			
a) written examination (approx. 90 to 1 30 minutes) or c) oral examination in g or d) log (approx. 20 pages) or e) prese and length of assessment prior to the c Language of assessment: German, Eng	roups (groups of 2: a ntation (approx. 30 n ourse.	pprox. 30 minutes, g	groups of 3: approx. 40 minutes)			
Allocation of places						
Additional information						
Workload						
Teaching cycle						
	<del></del>					
Referred to in LPO I (examination regulations for teaching-degree programmes)						

Module appears in



Modul	Module title Abbreviation						
Advan	Advanced Research Project 08-OCM-AKP1-122-mo1						
Module coordinator Module offered by					L		
head of the research group offering the modu			e module	Institute of Organic	Chemistry		
ECTS	Metho	ethod of grading Only after succ. compl. of module(s)					
5	(not)	successfully completed					
Durati	on	Module level	Other prerequisites				
1 seme	ester	graduate					
Conte	Contents						
This module gives students the opportunity to get involved in the work of one of the research groups based at the Institute of Organic Chemistry and learn some advanced synthesis and analytical methods.							
Intend	ed lear	ning outcomes					
		able to describe and use well as to describe theor		s and analytical met	hods typically used by the rese-		
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)			
P (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	<u>e)</u>		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
		15 minutes) and log (appr ssessment: German or E					
Alloca	tion of p	olaces					
Additio	onal inf	ormation					
Worklo	oad						
			•				
Teachi	ng cycl	e					
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	ımmes)			
Modul	e appea	ars in					
	Master's degree (1 major) Chemistry (2013)						
Maste	Master's degree (1 major) Chemistry (2014)						



# **Compulsory Electives**

(ECTS credits)



Module title Abbreviation						
Modern	Modern Aspects of Natural Product Chemistry and Biological Chemistry 08-OCM-NAT-141-mo1					
Module	Module coordinator Module offered by					
lecturer of the seminar				Institute of Organic	Chemistry	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
This mo	odule d	iscusses advanced topic	s in natural product o	themistry and biolog	gical chemistry.	
Intende	ed learr	ning outcomes				
Studen	ts are a	able to discuss advanced	topics in natural pro	duct chemistry and	biological chemistry.	
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>essment</b> (type, scope, langua le for bonus)	ge $-$ if other than German, $\epsilon$	examination offered — if no	ot every semester, information on whether	
30 minu or d) log and len	utes) or g (appr gth of a	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocati	ion of p	olaces				
Chemis	try Mas	ster's: no restrictions. Bio	ochemistry Master's:	20 places. Places wi	ill be allocated by lot.	
Additio	nal info	ormation	,			
Worklo	ad					
Teachir	ng cycle	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	Module appears in					
Master's degree (1 major) Chemistry (2014)						



Module title Abbreviation								
Organic Functional Materials 08-OCM-FM-141-mo1								
Module coordinator				Module offered	by			
lecture	r of the	e seminar "Organische Fu	nktionsmaterialien"	Institute of Org	anic Chemistry			
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)				
5	nume	rical grade						
Duratio	on	Module level	Other prerequisites					
1 seme	ester	graduate						
Conter	nts							
linear (	optics.	such as field effect transi  ning outcomes	stors, organic light-er	nitting diodes, o	r organic solar cells as well as in nor			
The stuexplain	udents of the sy	are able to explain funda	nductor materials as v	vell as their app	organic semiconductors. He/She car lication in (opto)electronic compon- nic photovoltaics as well as in nonli-			
near o	S (type,	number of weekly contact hours,	anguage — if other than Ge	rman)				
	S (no information on SWS (weekly contact hours) and course language available)							
Course	nforma	tion on SWS (weekly con	Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)					
Course S (no i Metho	d of as	sessment (type, scope, langua	·		· · · · · · · · · · · · · · · · · · ·			

Allocation of places

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## **Additional information**

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## Workload

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# **Teaching cycle**

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 $\textbf{Referred to in LPO I} \ \ (\text{examination regulations for teaching-degree programmes})$ 

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## Module appears in

Master's degree (1 major) Chemistry (2014)

Language of assessment: German, English



Modul	Module title				Abbreviation		
Organ	o- and E	Biocatalysis			08-HKM1-141-m01		
Modul	e coord	inator		Module offered by	•		
lecture	r of the	seminar "Organo- and B	iokatalyse"	Institute of Organic	Chemistry		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate	-				
Conter	its						
proces	ses. Or	ganocatalysis: enantiose	lective implementation	on, principles, green	ounds and enzymes in catalytic chemistry, substance classes cts, especially regarding organic		
Intend	ed lear	ning outcomes					
scribe	the stru				eas of application. They can deable to mechanistically describe		
Course	<b>!S</b> (type, r	number of weekly contact hours,	anguage — if other than Ger	man)			
S (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	<u>e</u> )		
		<b>Sessment</b> (type, scope, langua le for bonus)	ge $-$ if other than German, $\epsilon$	examination offered — if no	ot every semester, information on whether		
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English							
Allocation of places							
Additio	onal inf	ormation					

## Workload

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## **Teaching cycle**

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

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# Module appears in



Module title				Abbreviation	
Supramolecular Chemistry (Basics)					08-SCM1-102-m01
Module coordinator				Module offered by	
lecturer of lecture "Organischen Chemie"			ie"	Faculty of Chemistry and Pharmacy	
ECTS	Method of grading Only after succ.		Only after succ. con	ompl. of module(s)	
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate			
Contents					
This module introduces students to the fundamental principles of supramolecular chemistry. It focuses on interactions between molecules, molecular recognition by receptors, complexes, supramolecular polymers, coordination polymers and networks, liquid crystals, self-assembly in aqueous media, synthetic ion channels and mo-					

# **Intended learning outcomes**

dern applications of supramolecular chemistry.

Students are able to explain interactions between molecules demonstrating a high degree of expertise in the field as well as to describe the formation, structure and polymers of coordination compounds. They are able to describe the self-assembly of polymers in aqueous media as well as to identify the characteristics of synthetic ion channels. They can name modern applications of supramolecular chemistry.

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

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

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

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

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#### Module appears in

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Functional Materials (2012)



Module	Module title Abbreviation					
		emistry			08-SCM3-141-m01	
Module	coord	inator		Module offered by		
		ture "Bioorganische Chen	nio" (Ricorganic	Institute of Organic	Chamistry	
Chemis		ture bioorganische Chen	ine (bloofganic	institute of Organic	Chemistry	
ECTS	Metho	od of grading	Only after succ. con	ıpl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate	-			
Conten	ts					
lar inte	raction	•	_		medicine. It focuses on molecu- new aspects of DNA, RNA, prote-	
Intende	ed lear	ning outcomes				
can exp	olain th scribe i	e molecular diversity of b modern aspects of DNA, F	oiological systems. Th RNA, proteins and car	ney can characterise bohydrates.	s of bioorganic chemistry. They the fabrication of agents. They	
		number of weekly contact hours, l			<b>\</b>	
		tion on SWS (weekly cont				
		<b>sessment</b> (type, scope, langua <sub>l</sub> le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and len	utes) o g (appi igth of	r c) oral examination in g	roups (groups of 2: a ntation (approx. 30 r ourse.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	Workload					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	ars in				



Module title Abbreviation					
Computational Chemistry				08-TCM2-141-m01	
Module coordinator			Module offered by	•	
lecturer of le	cture "Computational Che	mistry"	Institute of Physica	l and Theoretical Chemistry	
ECTS Met	hod of grading	Only after succ. con	npl. of module(s)		
5 num	erical grade				
Duration	Module level	Other prerequisites			
1 semester	graduate				
Contents					
This module	introduces students to the	e fundamental princip	oles of computationa	al chemistry.	
Intended lea	rning outcomes				
Students are putational c	•	etical principles of co	mputational chemist	try and to apply methods in com-	
Courses (type	, number of weekly contact hours,	language — if other than Ger	rman)		
S + Ü (no inf	ormation on SWS (weekly	contact hours) and co	ourse language avail	able)	
Method of a		ge — if other than German,	examination offered — if no	ot every semester, information on whether	
30 minutes) or d) log (ap and length o	or c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Allocation o	f places				
Additional i	nformation				
Workload					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					



Module title Abbreviation					Abbreviation	
Clinical and Analytical Chemistry (practical course) 08-PH-KACP-092					08-PH-KACP-092-m01	
Module	coord	inator		Module offered by		
		ture "Klinisch-analytische l Chemistry)	e Chemie" (Clinical	Institute of Pharma	cy and Food Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
This mo		overs practical topics in (	clinical chemistry and	d clinical diagnostics	s as well as the related analytical	
Intende	ed lear	ning outcomes				
Studen ments.	ts have	e developed a knowledge	of clinical analytical	chemistry and are a	ble to apply it to practical experi-	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (no in	format	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
examin	ation t	alks (Testate, approx. 15	minutes each), log (a	pprox. 5 to 10 pages	5)	
Allocat	ion of <sub>I</sub>	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master	Master's degree (1 major) Biochemistry (2012)					
	Master's degree (1 major) Chemistry (2013)					
	_	ee (1 major) Chemistry (2				
Master	Master's degree (1 major) Chemistry (2014)					



# **Physical Chemistry**

(25 ECTS credits)



# **Compulsory Courses**

(20 ECTS credits)



Module title Abbreviation					Abbreviation	
Laser S	pectro	scopy			08-PCM1a-132-m01	
Module	e coord	linator		Module offered by		
	_	minar "Laserspektroskopi	e" (Laser Spectros-	·	l and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	ıpl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
		ntroduces students to the spectroscopy.	fundamental princip	oles of laser spectros	scopy. It discusses absorption	
Intende	ed lear	ning outcomes				
		able to explain the compo			as well as the optical principles mission spectroscopy.	
Course	<b>S</b> (type, i	number of weekly contact hours, l	anguage — if other than Ger	rman)		
S + Ü (r	no info	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	t every semester, information on whether	
		nation (90 minutes) or ora		inutes)		
Allocat	-		-			
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master	Master's degree (1 major) Chemistry (2013)					
Master	Master's degree (1 major) Chemistry (2014)					



Module ti	 :le		Abbreviation		
Advanced	Advanced Physical Chemistry (Lab)			08-PCM1b-132-m01	
Module co	ordinator		Module offered by		
lecturer of copy)	seminar "Laserspektroskopi	ie" (Laser Spectros-	Institute of Physica	ll and Theoretical Chemistry	
ECTS M	ethod of grading	Only after succ. con	npl. of module(s)		
5 (n	ot) successfully completed				
Duration	Module level	Other prerequisites	i		
1 semeste	r graduate				
Contents					
boratory.		idents autonomously	conduct experimen	ds in physical chemistry in the la- its in the laboratory. Students will	
Intended	earning outcomes				
	nave developed a high level on ble to analyse the resulting r			ethods in physical chemistry.	
Courses (t	pe, number of weekly contact hours, l	anguage — if other than Ge	rman)		
P (no info	mation on SWS (weekly cont	act hours) and cours	e language available	e)	
	assessment (type, scope, langua ditable for bonus)	${\sf ge-if}$ other than German,	examination offered — if no	ot every semester, information on whether	
prox. 15 p		·	xperiment exams) (a	approx. 15 minutes) and log (ap-	
Allocation	of places				
Additiona	l information				
Additiona	information on module dura	ation: block placeme	nt with a duration of	a minimum of 20 working days.	
Workload					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module appears in

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



		TAOX N	C MEON ABUILD	, , , , , , , ,		
Module title					Abbreviation	
Chemical Dynamics					08-PCM2-102-m01	
Modul	e coord	inator		Module offered by	•	
lecture mics)	r of ser	ninar "Chemische Dynar	mik" (Chemical Dyna-	Institute of Physica	l and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	ıpl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts		`			
					ical kinetics and reaction dyna- cribing chemical reactions.	
Intend	ed lear	ning outcomes				
		able to discuss advance dels for the investigatio			dynamics. They can describe me-	
Course	<b>es</b> (type, r	number of weekly contact hours,	, language — if other than Ge	rman)		
S + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)	
Metho	d of ass	sessment (type, scope, langu	age — if other than German,	examination offered — if no	ot every semester, information on whether	
		le for bonus)				
		nation (90 minutes) or o ssessment: German or l		e candidate each (20	o minutes) or talk (30 minutes)	
Allocat	tion of <sub>I</sub>	olaces				
Additio	onal inf	ormation				
Worklo	ad					
	-					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2010)					

Master's degree (1 major) Chemistry (2014) Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)



Module	e title				Abbreviation
Physica	Physical Chemistry (Advanced Lab) 08-PCM6-132-mo1				
Module	coord	linator		Module offered by	
lecture	rs Phys	sikalische Chemie (Physic	al Chemistry)	Institute of Physica	l and Theoretical Chemistry
ECTS	Meth	od of grading	Only after succ. con	ıpl. of module(s)	
5	(not)	successfully completed	08-PCM1		
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
		gives students the opport of Physical Chemistry and			f the research groups based at lytical methods.
Intende	ed lear	ning outcomes			
					relevant physical chemistry resequestions in physical chemistry.
Course	<b>S</b> (type, i	number of weekly contact hours, l	anguage — if other than Ger	man)	
P (no in	forma	tion on SWS (weekly cont	act hours) and cours	e language available	e)
		sessment (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether
		(approx. 20 minutes) Issessment: German or El	nglish		
Allocat	ion of	places			
Additio	nal inf	ormation			
Additio	nal inf	ormation on module dura	tion: block placemer	nt with a duration of	a minimum of 20 working days.
Worklo	ad				
			,		
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	ars in			
Master's degree (1 major) Chemistry (2013)					



# **Compulsory Electives**

(ECTS credits)



Module title					Abbreviation
Nanoscale Materials					08-PCM3-102-m01
Module coordinator				Module offered by	
lecturer of the seminar "Nanoskalige Materialien"			Materialien"	Institute of Physical and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)	
5	nume	rical grade			
Duratio	Duration Module level		Other prerequisites		
1 seme	1 semester graduate				
Contents					

This module discusses advanced topics in nanoscale materials. It focuses on the structure, properties, fabrication, modern characterisation methods and application areas of nanoscale materials.

#### **Intended learning outcomes**

Students are able to characterise nanoscale materials. They are able to name analytical methods and application areas of nanoscale materials.

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

S + 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)

written examination (90 minutes) or oral examination of one candidate each (20 minutes) or talk (30 minutes) Language of assessment: German or English

#### Allocation of places

### **Additional information**

### Workload

#### **Teaching cycle**

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

### Module appears in

Bachelor' degree (1 major) Nanostructure Technology (2010)

Bachelor' degree (1 major) Nanostructure Technology (2012)

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)

Master's degree (1 major) Functional Materials (2012)



Module title					Abbreviation		
Ultrafa	st spec	troscopy and quantumce	ontrol		08-PCM4-141-m01		
Modul	e coord	inator		Module offered by			
	er of the	e seminar "Ultrakurzzeitsp rolle"	pektroskopie and	Institute of Physica	l and Theoretical Chemistry		
ECTS	Meth	od of grading	Only after succ. con	ıpl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ester	graduate	Prior successful con ly recommended.	npletion of modules	o8-PCM1a and o8-PCM1b is high-		
Conter	nts						
		liscusses advanced topic time-resolved laser spect			control. It focuses on ultrashort		
Intend	ed lear	ning outcomes					
plain the princip	he theo les and		spectroscopy and na n control.	me experimental me	naracterise them. They can exethods. They can describe the		
S + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)		
		<b>sessment</b> (type, scope, langua ole for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether		
(appro	x. 30 m	nation (approx. 90 minut inutes) Issessment: German, Eng		on of one candidate	each (approx. 20 minutes) or talk		
Allocat	tion of	places					
Additio	onal inf	ormation					
Worklo	oad						
Teaching cycle							
<del></del>							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							



Module title Abbreviation					Abbreviation	
Physical chemistry of supramolecular assemblies					08-PCM5-141-m01	
Module	coord	inator		Module offered by		
lecture: kularer		seminar "Physikalische uren"	Chemie Supramole-	Institute of Physica	l and Theoretical Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
		xamines the basic intera of aggregates as well as			he formation and physical-cheministry.	
Intende	ed lear	ning outcomes				
in the f	ield. Tł		ation and physical-c		trating a high degree of expertise of aggregates. They can name mo-	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
S + Ü (r	no info	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		sessment (type, scope, langua	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
written (approx	exami	nation (approx. 90 minut		on of one candidate	each (approx. 20 minutes) or talk	
Allocat	ion of <sub>I</sub>	places				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master'	's degr	ee (1 major) Chemistry (2	014)			



Module tit	le	Abbreviation						
Theoretica	l Chemistry (Basics)			08-TCM1-141-m01				
Module coordinator			Module offered by					
lecturer of	lecture "Theoretische Chemi	ie"	Institute of Physical and Theoretical Chemistry					
ECTS Method of grading Only after such			ucc. compl. of module(s)					
5 nu	merical grade							
Duration Module level		Other prerequisites						
1 semester graduate								
Contents								
This module introduces students to the fundamental principles of theoretical chemistry.								
Intended learning outcomes								
Students are able to describe the mathematical and physical principles underlying the quantum chemical and quantum dynamical approaches of theoretical chemistry.								
Courses (type, number of weekly contact hours, language — if other than German)								
S + 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) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English								
Allocation of places								
Additional information								
Workload								
Teaching cycle								
Referred to in LPO I (examination regulations for teaching-degree programmes)								
Module ap	Module appears in							



Module	title	,	Abbreviation					
Computational Chemistry					08-TCM2-141-m01			
Module coordinator				Module offered by				
lecturer of lecture "Computational Chemistry"			mistry"	Institute of Physical and Theoretical Chemistry				
ECTS	Metho	thod of grading Only after succ. compl. of module(s)						
5	nume	rical grade						
Duration Module level		Other prerequisites						
1 seme	ster	graduate						
Contents								
This module introduces students to the fundamental principles of computational chemistry.								
Intended learning outcomes								
Students are able to explain the theoretical principles of computational chemistry and to apply methods in computational chemistry.								
Courses (type, number of weekly contact hours, language — if other than German)								
S + 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) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course. Language of assessment: German, English								
Allocation of places								
Additional information								
Workload								
Teaching cycle								
Referred to in LPO I (examination regulations for teaching-degree programmes)								
Module appears in								



Module title					Abbreviation		
Programming in Theoretical Chemistry					o8-TCM3-102-mo1		
Modul	e coord	linator		Module offered by	l.		
lecture mie"	r of lec	ture "Programmiere	n in Theoretischer Che-	Institute of Physica	l and Theoretical Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites	;			
1 seme	ester	graduate					
Conter	ıts	, -					
		provides an introduc ation areas.	tion to the fundamentals	of programming in th	neoretical chemistry and discus-		
Intend	ed lear	ning outcomes					
		able to explain and name its application		ng languages typica	ly used in theoretical chemistry		
			hours, language — if other than Ge	rman)			
S + Ü (	no info	rmation on SWS (we	eekly contact hours) and co	ourse language avai	lable)		
		sessment (type, scope, ble for bonus)	language — if other than German,	examination offered — if no	ot every semester, information on whether		
		nd discussion of appassessment: Germar	orox. 5 programming exerc	ises as well as talk (	approx. 45 minutes)		
Allocat	tion of	places					
Additio	onal inf	ormation					
Worklo	oad						
		,					
Teachi	ng cycl	e					
	<u> </u>						
Referre	ed to in	LPO I (examination reg	ulations for teaching-degree progra	ammes)			
		(	action blogic	,			
_	e appe	ars in					
			tny (2012)				
Master	Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2010)						
	_	•					
Master	r's degr	•	itry (2010)				

Master's degree (1 major) Mathematics (2010)

Master's degree (1 major) Computational Mathematics (2012)



Modul	o titlo	_			Abbreviation		
		amista. Drainet course					
Theore	eticat Ci	nemistry - Project course	- wave-раскет супат		08-TCAP1-132-m01		
Modul	e coord	inator		Module offered by			
head c	f the re	search group offering the	module	Institute of Physica	al and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed					
Durati	on	Module level	Other prerequisites	i			
1 seme	ester	graduate					
Conte	ıts						
the Ins	stitute o				f the research groups based at used in the discipline. The focus		
Intend	ed lear	ning outcomes					
		e learned some of the me ics. They are able to exp			stry and, in particular, in wave f wave packet dynamics.		
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Ge	rman)			
P (no i	nformat	tion on SWS (weekly con	act hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
		(approx. 30 minutes) ssessment: German or E	nglish				
Alloca	tion of p	olaces					
Additio	onal inf	ormation					
Additio	onal inf	ormation on module dura	ation: 4 weeks.				
Workload							
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



Modul	e title		Abbreviation				
Theoretical Chemistry - Project coursewave function based methods 08-TCAP2-132-m01							
Module	e coord	inator		Module offered b	y		
head o	f the re	search group offering the	e module	Institute of Physi	cal and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its		•				
the Ins	titute o				of the research groups based at used in the discipline. The focus		
Intend	ed lear	ning outcomes					
					nistry and, in particular, in wave d of wave function methods.		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)			
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language availal	ole)		
		<b>sessment</b> (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if	f not every semester, information on whether		
		(approx. 30 minutes) ssessment: German or E	nglish				
Allocat	ion of p	places					
Additio	nal inf	ormation					
Additic	nal inf	ormation on module dura	ation: 4 weeks.				
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
-							
Module	e appea	ars in					
Master	Master's degree (1 major) Chemistry (2013)						



Module title Abbreviation						
Theoretical Chemistry - Project course Computational Photochemistry 08-TCAP3-132-m01						
Module	e coordinator		Module offered	by		
head of	f the research group offering th	ne module	Institute of Phys	ical and Theoretical Chemistry		
ECTS	Method of grading	Only after succ. con	npl. of module(s)			
5	(not) successfully completed					
Duratio	n Module level	Other prerequisites	i			
1 seme	ster graduate					
Conten	ts					
the Inst		and learn some of the		e of the research groups based at y used in the discipline. The focus		
Intende	ed learning outcomes					
				emistry and, in particular, in theoretield of theoretical photochemistry.		
Course	<b>S</b> (type, number of weekly contact hours	, language — if other than Ge	rman)			
P (no in	formation on SWS (weekly co	ntact hours) and cours	e language availa	able)		
	d of assessment (type, scope, lang creditable for bonus)	uage — if other than German,	examination offered —	if not every semester, information on whether		
	tation (approx. 30 minutes) ge of assessment: German or	English				
Allocati	ion of places					
Additio	nal information					
Additio	nal information on module du	ration: 4 weeks.				
Worklo						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



Module titl	e			Abbreviation		
Material So	iences 1 (Principles)			08-FS1-141-m01		
Module cod	ordinator		Module offered by			
Dean of Stu	ıdies Funktionswerkstoffe (I	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis		
ECTS Me	thod of grading	Only after succ. com	pl. of module(s)			
5 nui	merical grade					
Duration	Module level	Other prerequisites				
1 semester	undergraduate					
Contents						
	e discusses the fundamenta operties of materials.	al relations between o	chemical bonding, th	ne structure, the microstructure		
Intended le	arning outcomes					
microstruct blems.		aterials. They have do	eveloped the ability	al bonding, the structure, the to apply them to research pro-		
				ahla)		
	formation on SWS (weekly			•		
	itable for bonus)	ge — ir otner than German, e	examination offered — if no	ot every semester, information on whether		
30 minutes or d) log (a and length	) or c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocation	of places					
Additional information						
Workload						
Teaching cycle						
Referred to	Referred to in LPO I (examination regulations for teaching-degree programmes)					



Module title Abbreviation							
Lab Co	urse M	aterials Science			08-FMM-MP-102-m01		
Modul	e coord	inator		Module offered by			
	rs spec Materi	ialisation subject Funktic als)	onsmaterialien (Fun-	Chair of Chemical T	echnology of Material Synthesis		
ECTS	Metho	od of grading	Only after succ. con	ipl. of module(s)			
5	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conter	ıts						
Ten se	lected e	experiments in materials	science.				
Intend	ed lear	ning outcomes					
Studer	nts have	e developed an advanced	proficiency in the pe	erformance of experi	ments in materials science.		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)			
P (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
cal per	forman	e-experiment exams) and ce, log (5 to 10 pages) ssessment: German or Ei	•	xperiment exams) (1	5 minutes), assessment of practi-		
	tion of p		, <u> </u>				
Additio	onal inf	ormation					
Worklo	ad						
Teachi	Teaching cycle						
<del></del>							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Modul	Module appears in						
	Master's degree (1 major) Chemistry (2013)						
	Master's degree (1 major) Chemistry (2010)						
Master	Master's degree (1 major) Chemistry (2014)						



# **Biochemistry**

(25 ECTS credits)



# **Compulsory Courses**

(15 ECTS credits)



Module title Abbreviation							
Molecu	lar Bio	logy			08-BC-MOLM-141-m01		
Module	coord	inator		Module offered by			
holder	of the (	Chair of Biochemistry		Chair of Biochemis	try		
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)	•		
5	numei	rical grade					
Duratio		Module level	Other prerequisites				
1 semes	ster	undergraduate					
Conten	ts						
Compri			this module discusse	s advanced topics ii	n molecular physiology and func-		
Intende	d learr	ning outcomes					
Studen	ts have	e developed a sound kno	wledge of molecular	biology.			
Courses	<b>5</b> (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)			
V + Ü (n	o infor	rmation on SWS (weekly	contact hours) and co	ourse language avail	lable)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
didate of 30 minuabout t	each (a utes, gi he met	approx. 20 minutes) or d)	oral examination in g inutes) or d) presenta sessment prior to the	groups of up to 3 car ution (approx. 30 mir	or c) oral examination of one can- ndidates (groups of 2: approx. nutes). Students will be informed		
Allocati	ion of p	olaces					
Additio	nal info	ormation					
Worklo	Workload						
Teachir	Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						



				Tarr		
Module				Abbreviation		
Molecul	ar Biology Lab			08-BC-MOLP-141-m01		
Module	coordinator		Module offered by			
holder o	f the Chair of Biochemistry		Chair of Biochemis	try		
ECTS I	Method of grading	Only after succ. com	pl. of module(s)			
10	numerical grade					
Duration	Module level	Other prerequisites				
1 semest	ter undergraduate					
Contents	S					
of macro				ngineering and characterisation is of biochemical processes, and		
Intended	l learning outcomes					
Students	s have developed a knowledge	of molecular biology	and are able to app	oly it to practical experiments.		
Courses	(type, number of weekly contact hours, l	anguage — if other than Ger	man)			
Ü (no inf	formation on SWS (weekly con	act hours) and cours	e language available	e)		
		ge $-$ if other than German, $\epsilon$	examination offered — if no	ot every semester, information on whether		
	creditable for bonus)		,			
didate easo minus about th Assessm	ach (approx. 20 minutes) or d)	oral examination in a nutes) or e) presenta sessment prior to the er semester	groups of up to 3 car tion (approx. 30 mir	or c) oral examination of one can- ndidates (groups of 2: approx. nutes). Students will be informed		
Allocatio	on of places					
Biochem	nistry Bachelor's: 24 places. Ch	emistry Master's: 6 p	laces.			
Additional information						
Workload						
Teaching cycle						
Referred	Referred to in LPO I (examination regulations for teaching-degree programmes)					



# **Compulsory Electives**

(ECTS credits)

# **Specialist Lab Course**

(10 ECTS credits)



Module	e title				Abbreviation	
Practic	Practical course Molecular Machines for advanced students 08-BC-VPMM-141-mo1					
Module	e coord	inator		Module offered by		
holder	of the (	Chair of Biochemistry		Chair of Biochemis	try	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade	o8-BC-MOLP			
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its					
lar biol	ogy an		mutagenesis, protein	expression and pur	d methods and topics in molecu- ification, RNA-protein and prote- nplexes.	
Intend	ed lear	ning outcomes				
Studen work.	its are a	able to explore a specific	research topic and d	eliver an oral presen	ntation on the results of their	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)		
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
•	•	o pages) and talk (approssessment: German, Eng	-			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Additional information on module duration: block placement with a duration of a minimum of 40 working days.						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						



Module	title		Abbreviation			
Practical course Protein Degradation in Eukaryotes for advanced students 08-BC-VPPD-141-mo1						
Module	coord	linator		Module offered b	у	
holder	of the	Chair of Biochemistry		Chair of Biochem	istry	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
10	nume	rical grade	o8-BC-MOLP			
Duratio	n	Module level	Other prerequisites	3		
1 seme	ster	graduate				
Conten	ts		`			
This mo	_	gives students the opp	oortunity to explore a res	search topic in the	field of protein degradation in eu-	
Intende	ed lear	ning outcomes				
Studen work.	ts are	able to explore a spec	ific research topic and c	leliver an oral pres	entation on the results of their	
Course	<b>S</b> (type, i	number of weekly contact ho	urs, language — if other than Ge	rman)		
P (no in	ıforma	tion on SWS (weekly c	ontact hours) and cours	se language availal	ole)	
		sessment (type, scope, landle for bonus)	nguage — if other than German,	examination offered — if	f not every semester, information on whether	
		o pages) and talk (ap ssessment: German,				
Allocat	ion of	places				
Additio	nal inf	ormation				
Additio	nal inf	ormation on module o	luration: block placeme	nt with a duration (	of a minimum of 40 working days.	
Worklo	ad					
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appe	ars in				



Module title					Abbreviation
Practical course RNA Biochemistry for advanced students					08-BC-VPRB-141-m01
Module	coord	inator		Module offered by	l
holder	of the (	Chair of Biochemistry	l .	Chair of Biochemis	try
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)	
10	nume	rical grade	o8-BC-MOLP		
Duratio	n	Module level	Other prerequisites	1	
1 seme	ster	graduate			
Conten	ts				
mes as	"mole		ulatory mechanisms of e		eld of RNA biochemistry. Riboso- synthesis. Gradient centrifugati-
Intende	ed lear	ning outcomes			
work. T	hey are	able to familiarise t	hemselves with different	mechanisms of gene	ntation on the results of their eral and specific translation con appropriate and understandable
Course	<b>S</b> (type, r	number of weekly contact h	ours, language — if other than Ge	rman)	
P (no in	nformat	tion on SWS (weekly	contact hours) and cours	e language available	e)
<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)					
log (approx. 20 pages) and talk (approx. 15 minutes) Language of assessment: German, English					
Allocat	ion of p	nlaces			

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### **Additional information**

Additional information on module duration: block placement with a duration of a minimum of 40 working days.

### Workload

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# **Teaching cycle**

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

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### Module appears in



Module title					Abbreviation	
Practical course Structural Biology for advanced students					08-BC-VPSB-141-m01	
Modul	le coord	linator		Module offered by		
holde	r of the	Chair of Biochemistry		Chair of Biochemis	try	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade	o8-BC-MOLP			
Durati	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conte	nts					
the fu		ntal principles and tecl			stallisation. It teaches students sation as well as crystallographic	
Intend	led lear	ning outcomes				
					constructs for crystallisation. Il as data collection and proces-	
Course	<b>es</b> (type, ı	number of weekly contact hou	ırs, language — if other than Ge	rman)		
P (no i	nforma	tion on SWS (weekly c	ontact hours) and cours	e language available	e)	
		sessment (type, scope, lar ble for bonus)	nguage — if other than German,	examination offered — if no	ot every semester, information on whether	
		o pages) and talk (ap assessment: German,				
Alloca	tion of	places				
Additional information						
Additional information on module duration: block placement with a duration of a minimum of 40 working days.						
Workload						
Teach	Teaching cycle					
	<u>.</u>					

Master's degree (1 major) Chemistry (2014)

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

# **Other Courses**

(ECTS credits)



Module title Abbreviation							
Principles of drug design					o8-MCM3-132-mo1		
Module	e coord	inator		Module offered by	I.		
lecture mistry)		mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ıts						
cophor QSAR. gies, b	re mode Predict ioisoste	els, docking, virtual scree ions of pharmacokinetic erism, SAR.	ning, simulation met	hods, de novo desig	ure-based drug design, pharmagn. Ligand-based drug design. ase examples, prodrug strate-		
	-	ning outcomes					
		ter the theoretical and ex		,	g design.		
		number of weekly contact hours, l					
		rmation on SWS (weekly	•				
		<b>sessment</b> (type, scope, langua <sub>l</sub> le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
		with discussion (approx. ssessment: German or E					
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
	_						
Worklo	ad						
Teachi	Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
	Module appears in						
	Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2014)						



Module	title				Abbreviation		
Bioano	rganic	Chemistry			08-ACM2-141-m01		
Module	Module coordinator Module offered by						
and Me	dizinis	ninar "Anorganische Aspo chen Chemie" (Inorganic dicinal Chemistry)		Institute of Inorgan	ic Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate	-				
Conten	ts						
	ls of BI				chemistry (BIC). It discusses the ns of BIC in the fields of diagnosis		
Intende	ed lear	ning outcomes					
		able to describe the princus enzymes and describe			xplain the structure and effects medicine.		
		number of weekly contact hours, l	_ · ·	•			
		tion on SWS (weekly cont			e)		
		sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	t every semester, information on whether		
30 min or d) lo and len	utes) o g (appi igth of	r c) oral examination in g	roups (groups of 2: a ntation (approx. 30 r ourse.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type		
Allocat							
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			
Module appears in							
Master	Master's degree (1 major) Chemistry (2014)						



Module title Abbreviation							
Modern Aspects of Natural Product Chemistry and Biological Chemistry 08-0CM-NAT-141-mo1							
Module	coord	inator		Module offered by	,		
lecture	r of the	seminar		Institute of Organic	Chemistry		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
This mo	odule d	iscusses advanced topic	s in natural product o	themistry and biolog	gical chemistry.		
Intende	ed learr	ning outcomes					
Studen	ts are a	able to discuss advanced	topics in natural pro	duct chemistry and	biological chemistry.		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)		
		<b>essment</b> (type, scope, langua le for bonus)	ge $-$ if other than German, $\epsilon$	examination offered — if no	ot every semester, information on whether		
30 minu or d) log and len	utes) or g (appr gth of a	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type		
Allocati	ion of p	olaces					
Chemis	try Mas	ster's: no restrictions. Bio	ochemistry Master's:	20 places. Places wi	ill be allocated by lot.		
Additio	nal info	ormation	,				
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						
Master'	Master's degree (1 major) Chemistry (2014)						



Organo- and Biocatalysis       Module coordinator     Module offered by       lecturer of the seminar "Organo- and Biokatalyse"     Institute of Organic Chemistry       ECTS     Method of grading     Only after succ. compl. of module(s)       5     numerical grade						
lecturer of the seminar "Organo- and Biokatalyse"  Institute of Organic Chemistry  ECTS Method of grading Only after succ. compl. of module(s)						
ECTS Method of grading Only after succ. compl. of module(s)						
5 numerical grade						
Duration Module level Other prerequisites						
1 semester graduate						
Contents						
processes. Organocatalysis: enantioselective implementation, principles, green chemistry, substance clas and application areas. Biocatalysis: effects of enzymes in view of different aspects, especially regarding or synthesis.						
Intended learning outcomes						
Students are able to categorise organocatalysts and explain their effects and areas of application. They ca scribe the structure and applications of enzymes in organic synthesis. They are able to mechanistically defend analyse the effects of enzymes.						
Courses (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 who module is creditable for bonus)	ether					
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 min or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the t and length of assessment prior to the course.  Language of assessment: German, English	utes)					
Allocation of places						
Additional information						
Workload						
<del></del>						
Teaching cycle						
Teaching cycle						



Module title Abbreviation						
Clinica	l and A	nalytical Chemistry			08-PH-KAC-092-m01	
Module	coord	inator		Module offered by		
		ture "Klinisch-analytische l Chemistry)	e Chemie" (Clinical	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
This mo	odule d	liscusses advanced topic	s in clinical analytica	l chemistry.		
Intende	ed lear	ning outcomes				
Studen	ts have	e developed an advanced	knowledge of molec	ular biology.		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
Method	d of ass	sessment (type, scope, langua	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		le for bonus)				
written	examiı	nation (120 minutes)				
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module appears in						
	Master's degree (1 major) Biochemistry (2012)					
	Master's degree (1 major) Chemistry (2013)					
	_	ee (1 major) Chemistry (2				
Master's degree (1 major) Chemistry (2014)						



Module title Abbreviation							
Clinical and Analytical Chemistry (practical course) 08-PH-KACP-092-m01							
Module	e coord	linator		Module offered by	L		
		ture "Klinisch-analytische l Chemistry)	e Chemie" (Clinical	Institute of Pharma	cy and Food Chemistry		
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)			
5	(not)	successfully completed					
Duratio	n	Module level	Other prerequisites	1			
1 seme	ster	undergraduate					
Conten	ts						
This mo		covers practical topics in	clinical chemistry and	d clinical diagnostics	s as well as the related analytical		
Intende	ed lear	ning outcomes					
Studen ments.		e developed a knowledge	of clinical analytical	chemistry and are a	ble to apply it to practical experi-		
Course	<b>S</b> (type, i	number of weekly contact hours, I	anguage — if other than Ge	rman)			
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)		
		sessment (type, scope, langua	${\sf ge-if}$ other than German,	examination offered — if no	ot every semester, information on whether		
examin	ation t	alks (Testate, approx. 15	minutes each), log (a	approx. 5 to 10 pages	5)		
Allocat	ion of	places					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	le					
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	ammes)			
	(						
Module	e appe	ars in					
	Master's degree (1 major) Biochemistry (2012)						
Master	Master's degree (1 major) Chemistry (2013)						
	_	ree (1 major) Chemistry (2					
Master	Master's degree (1 major) Chemistry (2014)						

# **Functional Materials**

(25 ECTS credits)



# **Compulsory Courses**

(20 ECTS credits)



Module	Module title Abbreviation					
Lab Co	urse M	aterials Science			08-FMM-MP-102-m01	
Module	e coord	inator		Module offered by		
lecture ctional	•	ialisation subject Funktic	onsmaterialien (Fun-	Chair of Chemical T	echnology of Material Synthesis	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed	-			
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its					
Ten sel	lected e	experiments in materials	science.			
Intend	ed lear	ning outcomes				
Studer	its have	e developed an advanced	proficiency in the pe	erformance of experi	ments in materials science.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
cal per	forman	e-experiment exams) and ce, log (5 to 10 pages) essessment: German or Ei	·	xperiment exams) (1	5 minutes), assessment of practi-	
Allocat						
Additio	nal inf	ormation				
	_					
Worklo	ad					
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	Module appears in					
Master	Master's degree (1 major) Chemistry (2013)					
	Master's degree (1 major) Chemistry (2010)					
Master	Master's degree (1 major) Chemistry (2014)					



Module	Module title Abbreviation						
Project Work 08-FMM-PA-102-mo1							
Module	e coord	inator		Module offered by			
head o	f the re	search group offering the	e module	Chair of Chemical T	echnology of Material Synthesis		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its						
		ives students the opport findings.	unity to explore a res	earch topic under th	e guidance of a supervisor and to		
Intende	ed learı	ning outcomes					
Studen	its have	e developed an advanced	proficiency in the pe	erformance of experi	ments in materials science.		
Course	<b>S</b> (type, r	umber of weekly contact hours, l	anguage — if other than Ger	rman)			
P (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	<u>e)</u>		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
		5 minutes) and log (appr ssessment: German or Er					
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						
	Master's degree (1 major) Chemistry (2013)						
		ee (1 major) Chemistry (2					
Master	Master's degree (1 major) Chemistry (2014)						



Wi	ÜRZBU	JRG 1	5 (2. 7. 7. 8)	33 0 2 1	Master's with 1 major, 120 ECTS credits			
Module title Abbreviation								
Organi	Organic Functional Materials				08-OCM-FM-141-m01			
Module	coord	inator		Module offered	i by			
lecture	r of the	seminar "Organische Fu	nktionsmaterialien"	Institute of Org	anic Chemistry			
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s	)			
5	nume	rical grade						
Duratio	n	Module level	Other prerequisites	i				
1 seme	ster	graduate						
Conten	ts							
sical effects in organic molecular and polymeric semiconductors as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in non-linear optics.  Intended learning outcomes  The students are able to explain fundamental (photo)physical processes in organic semiconductors. He/She can explain the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlinear optics.								
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)				
S (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language avai	lable)			
<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)								
30 min or d) lo and len	a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, 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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 $\textbf{Referred to in LPO I} \ \ (\text{examination regulations for teaching-degree programmes})$ 

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# Module appears in



Module title					Abbreviation	
Material Sciences 1 (Principles)					08-FS1-141-m01	
Modul	e coord	inator		Module offered by		
Dean c	f Studie	es Funktionswerkstoffe (F	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conter	ıts					
		iscusses the fundamentarties of materials.	al relations between o	chemical bonding, th	ne structure, the microstructure	
Intend	ed learı	ning outcomes				
	tructure				al bonding, the structure, the to apply them to research pro-	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V + Ü (	no infor	mation on SWS (weekly o	contact hours) and co	urse language avail	able)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and lei	utes) o og (appr ogth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type	
Allocat	tion of p	olaces				
Additional information						
Workload						
Teaching cycle						
<del></del>						



# **Compulsory Electives**

(ECTS credits)



Module	Module title Abbreviation						
Material Sciences 2 (Materials) 08-FS2-141-m01							
Module	e coord	inator		Module offered by			
Dean o	f Studie	es Funktionswerkstoffe (F	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	its						
This m	odule d	eals with the fabrication	and properties of the	main material grou	ps.		
Intend	ed learı	ning outcomes					
		e developed a knowledge knowledge to research pr		d properties of the n	nain material groups and are able		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V + Ü (ı	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		<b>eessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
30 min or d) lo and ler	utes) o g (appr ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	e appea	rs in					
	appears						



Module title Abbreviation							
Chemically and bio-inspired Nanotechnology for Material S				synthesis	08-NTM-141-m01		
Module	coord	inator		Module offered by			
holder thesis	of the	Chair of Chemical Techno	logy of Material Syn-	Chair of Chemical T	echnology of Material Synthesis		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade	-				
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate	-				
Conten	ts						
of anal	ysis us		nerated materials. It	also discusses the fo	istry and discusses the methods undamental principles of biomiynthesis.		
Intende	ed lear	ning outcomes					
Studen	ts have	e developed an advanced	knowledge of sol-ge	l chemistry and bior	nineralisation.		
Course	<b>S</b> (type, i	number of weekly contact hours, l	anguage — if other than Ger	man)			
V + V (r	no info	rmation on SWS (weekly o	contact hours) and co	urse language avail	able)		
		<b>sessment</b> (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
30 min or d) lo	utes) o g (app	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of	places					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						
	Master's degree (1 major) Chemistry (2014)						



Module title					Abbreviation	
Nanoscale Materials					08-PCM3-102-m01	
Module coordinator				Module offered by		
lecturer of the seminar "Nanoskalige Materialien"			Materialien"	Institute of Physical and Theoretical Chemistry		
ECTS	Metho	od of grading Only after succ. co		npl. of module(s)		
5	nume	rical grade				
Duration Module level		Other prerequisites				
1 semester		graduate				
Contents						

This module discusses advanced topics in nanoscale materials. It focuses on the structure, properties, fabrication, modern characterisation methods and application areas of nanoscale materials.

#### **Intended learning outcomes**

Students are able to characterise nanoscale materials. They are able to name analytical methods and application areas of nanoscale materials.

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

S + 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)

written examination (90 minutes) or oral examination of one candidate each (20 minutes) or talk (30 minutes) Language of assessment: German or English

#### Allocation of places

### **Additional information**

### Workload

#### **Teaching cycle**

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

#### Module appears in

Bachelor' degree (1 major) Nanostructure Technology (2010)

Bachelor' degree (1 major) Nanostructure Technology (2012)

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)

Master's degree (1 major) Functional Materials (2012)



Module title					Abbreviation
Supramolecular Chemistry (Basics)					08-SCM1-102-m01
Module coordinator				Module offered by	
lecturer of lecture "Organischen Chemie"			e"	Faculty of Chemistry and Pharmacy	
ECTS	Metho	ethod of grading Only after succ. co		npl. of module(s)	
5	nume	merical grade			
Duration Module level		Module level	Other prerequisites		
1 semester		graduate			
Contents					
This module introduces students to the fundamental principles of supramolecular chemistry. It focuses on inter-					

actions between molecules, molecular recognition by receptors, complexes, supramolecular polymers, coordination polymers and networks, liquid crystals, self-assembly in aqueous media, synthetic ion channels and modern applications of supramolecular chemistry.

### **Intended learning outcomes**

Students are able to explain interactions between molecules demonstrating a high degree of expertise in the field as well as to describe the formation, structure and polymers of coordination compounds. They are able to describe the self-assembly of polymers in aqueous media as well as to identify the characteristics of synthetic ion channels. They can name modern applications of supramolecular chemistry.

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

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

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

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

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#### Module appears in

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Functional Materials (2012)



Module title		Abbreviation				
Computatio	nal Chemistry			08-TCM2-141-m01		
Module coo	dinator		Module offered by			
lecturer of le	cture "Computational Che	mistry"	Institute of Physical and Theoretical Chemistry			
ECTS Met	hod of grading	Only after succ. con	mpl. of module(s)			
5 num	erical grade					
Duration	Module level	Other prerequisites				
1 semester	graduate					
Contents						
This module	introduces students to the	e fundamental princip	oles of computationa	al chemistry.		
Intended lea	rning outcomes					
Students are putational c	•	etical principles of co	mputational chemist	try and to apply methods in com-		
Courses (type	, number of weekly contact hours,	language — if other than Ger	man)			
S + Ü (no inf	ormation on SWS (weekly	contact hours) and co	ourse language avail	able)		
Method of a		ge — if other than German,	examination offered — if no	ot every semester, information on whether		
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English						
Allocation of places						
[						
Additional i	nformation					
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module app	Module appears in					



Module	Module title Abbreviation					
Molecular Materials (Lecture)					08-FMM-CT-141-m01	
Module	coord	inator		Module offered by		
Dean o	f Studi	es Funktionswerkstoffe (F	unctional Materials)	Chair of Chemical Technology of Material Synthesis		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
This mo	odule d	iscusses the theoretical	principles of molecul	ar and soft materials	5.	
Intende	ed lear	ning outcomes				
	Students have developed a knowledge of the principles of molecular and soft materials and are able to apply that knowledge to research problems.					
Course	Courses (type, number of weekly contact hours, language — if other than German)					
V + Ü (r	no infor	rmation on SWS (weekly o	contact hours) and co	urse language avail	able)	
	<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)					
present	tation (	approx. 30 minutes) and	examination			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master'	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation	
Solid s	tate ch	emistry and inorganic m	aterials		08-ACM3-141-m01	
Modul	e coord	inator		Module offered by		
lecturer of seminar "Festkörperchemie and Anorganische Materialien" (Solid State Chemistry and Inorganic Materials)				Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conter	ıts					
		provides an introduction to nthesis methods and sel			structure, chemical and physical	
Intend	ed lear	ning outcomes				
					plain methods for solid-state the corresponding solids.	
Course	S (type, i	number of weekly contact hours, l	anguage — if other than Ger	rman)		
S (no i	nforma	tion on SWS (weekly cont	tact hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and ler	utes) o og (app ogth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
	tion of		,			
Additio	onal inf	ormation				
Worklo	ad					
Teachi	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Modul	e appea	ars in				
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation
Polymer Chemistry					03-FU-PM1-141-m01
Module	Module coordinator			Module offered by	
holder of the Chair of Functional Materials in Medicine and Dentistry			ials in Medicine and	Faculty of Medicine	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duration Module level Other			Other prerequisites		
1 semester graduate					
Conten	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 are familiar with the fundamentals of polymer chemistry and the related methods for their characterisation.

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.

- o3-FU-PM1-1-141: V (no information on SWS (weekly contact hours) and course language available)
- 03-FU-PM1-2-122: P (no information on SWS (weekly contact hours) and course language available)

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

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

### Assessment in module component 03-FU-PM1-1-141: Polymer Chemistry (Lecture)

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

#### Assessment in module component 03-FU-PM1-2-122: Polymer Chemistry (Practical course)

- 2 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each) and logs (approx. 5 pages each)

Assessment offered: once a year, summer semester					
Language of assessment: German, English if agreed upon with the examiner					
Allocation of places					
Additional information					
Workload					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					

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	reg. data record Master (120 ECTS) Chemie - 2014	



### Module appears in



Module title					Abbreviation		
Polymers II					03-PM2-122-m01		
Module	e coord	inator		Module offered by			
holder Dentist		Chair of Functional Mater	ials in Medicine and	Faculty of Medicine			
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)			
5	numei	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
group a graphie	analysis es, poly				meation chromatography, end- block-copolymers, polymer topo-		
		ire an advanced knowled	dge of polymer synth	esis modification ar	nd characterication		
		umber of weekly contact hours, l			id characterisation.		
		mation on SWS (weekly			ahla)		
a) writt (30 mir	en exar	le for bonus) mination (approx. 90 min	utes) or b) oral exam		date each (20 minutes) or c) talk		
Allocat		ssessment: German or Ei	18(15)1				
	1011 01 }	naces					
Additio	nal info	ormation					
		ormacion .					
Worklo	ad						
Teachi	ng cycle	<u> </u>					
	3 3,30	-					
	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			
			00 6.00.00	,			
Module	e appea	rs in					
		ee (1 major) Chemistry (2	013)				
Master	's degre	ee (1 major) Chemistry (2	014)				
Master	Master's degree (1 major) Technology of Functional Materials (2010)						

Master's degree (1 major) Functional Materials (2012)

### **Homogeneous Catalysis**

(25 ECTS credits)



### **Compulsory Courses**

(20 ECTS credits)



Module title					Abbreviation	
Organo- and Biocatalysis 08-HKM1-141-m01					08-HKM1-141-m01	
Modul	e coord	inator		Module offered by	I.	
lecture	er of the	seminar "Organo- and B	iokatalyse"	Institute of Organic	Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts		•			
proces	ses. Or plication	ganocatalysis: enantiose	elective implementati	on, principles, greer	oounds and enzymes in catalytic n chemistry, substance classes ects, especially regarding organic	
Intend	ed lear	ning outcomes				
scribe	the stru				reas of application. They can deable to mechanistically describe	
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
S (no i	nforma	tion on SWS (weekly con	tact hours) and cours	e language availabl	e)	
		sessment (type, scope, langua ble for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and le	outes) o og (appi ngth of	r c) oral examination in g	groups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, §	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Alloca	tion of <sub> </sub>	places				
Additio	onal inf	ormation	•			
Workload						
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					

Module appears in



Module	e title				Abbreviation	
Advanc	ced org	anometallic chemistry ar	nd its application in h	nomogeneous cata-	08-HKM2-141-m01	
lysis						
Module	e coord	inator		Module offered by		
		seminar "Spezielle Meta wendung in der Homogen		Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its					
This mo	odule e	examines elementary orga	anic compounds of tra	ansition metals with	homogeneous catalytic applica-	
Intend	ed lear	ning outcomes				
					nentary organic compounds. They neous catalysis reactions.	
Course	<b>S</b> (type, i	number of weekly contact hours, l	anguage — if other than Ger	man)		
S (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		sessment (type, scope, langua ble for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and ler	utes) o g (app ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of	places	,			
			,			
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appe	ars in				



Module	Module title Abbreviation						
		!!	-i- i- Ii- Ch	!atm.	Abbreviation		
Practic	al cour	se Homogeneous catalys	sis in inorganic Cnem	istry	08-HKM3AC-132-m01		
Module	e coord	inator		Module offered by			
		seminar "Spezielle Meta wendung in der Homoger		Institute of Inorgan	nic Chemistry		
ECTS		od of grading	Only after succ. con	pl. of module(s)			
5	(not)	successfully completed		•			
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its						
thods i and cry	n homo /stallog	ogeneous catalysis. The f	ocus will be on cataly expected to conduct t	st synthesis and ch	synthesis and analytical me- paracterisation, spectral analysis independently, write a lab report		
Intend	ed lear	ning outcomes					
					eneous catalysis in the lab and to dings and deliver a presentation.		
Course	<b>S</b> (type, r	number of weekly contact hours,	anguage — if other than Ger	man)			
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language availabl	e)		
		sessment (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if n	ot every semester, information on whether		
		with lab report (approx. ssessment: German or E		pprox. 15 minutes)			
Allocat	ion of p	places					
Additio	nal inf	ormation					
Additio	nal inf	ormation on module dura	ation: block placemer	nt with a duration of	a minimum of 20 working days.		
Worklo	Workload						
<del></del>							
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



Module	Module title Abbreviation						
					Abbreviation 08-HKM3OC-132-m01		
Practic	Practical course Homogeneous catalysis in Organic Chemistry 08-HKM3OC-132-mo1						
Module	e coord	inator		Module offered by			
		seminar "Spezielle Meta wendung in der Homoger		Institute of Organic	c Chemistry		
ECTS		od of grading	Only after succ. con	ipl. of module(s)			
5	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its						
thods i and cry	n homo stallog	ogeneous catalysis. The f	ocus will be on cataly expected to conduct t	st synthesis and ch	synthesis and analytical me- naracterisation, spectral analysis independently, write a lab report		
Intend	ed lear	ning outcomes					
					eneous catalysis in the lab and to dings and deliver a presentation.		
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)			
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language availabl	e)		
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if n	ot every semester, information on whether		
		with lab report (approx. ssessment: German or E		pprox. 15 minutes)			
Allocat	ion of p	places					
Additio	nal inf	ormation					
Additio	nal inf	ormation on module dura	ation: block placemer	nt with a duration of	a minimum of 20 working days.		
Worklo	ad						
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



### **Compulsory Electives**

(ECTS credits)



Modul	e title				Abbreviation	
Advanced transition metal chemistry 08-HKM4-141-mo1					08-HKM4-141-m01	
Module coordinator				Module offered by		
lecture	er of the	seminar "Spezielle Übe	rgangsmetallchemie"	Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Durati	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conte	nts					
nation	chemis				of transition metals and coordi- discusses recent developments	
Intend	ed lear	ning outcomes				
		able to explain transition field. They can explain t			monstrating a high degree of exchemistry.	
Course	<b>es</b> (type, r	number of weekly contact hours,	language — if other than Ger	man)		
S (no i	nforma	tion on SWS (weekly cor	tact hours) and cours	e language availabl	e)	
		<b>sessment</b> (type, scope, langu ble for bonus)	age — if other than German, o	examination offered — if no	ot every semester, information on whether	
30 mir or d) lo and le	nutes) o og (appi ngth of	r c) oral examination in	groups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, į	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Alloca	tion of <sub>I</sub>	places				
Additi	onal inf	ormation				
Workle	oad					
Teachi	ing cycl	e				
Referr	ed to in	LPO I (examination regulatio	ns for teaching-degree progra	mmes)		
	,					
Modul	e appea	ars in				



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Module title					Abbreviation		
Chemic	cal Dyn	amics			08-PCM2-102-m01		
Modul	e coord	inator		Module offered by			
lecture mics)	r of sen	ninar "Chemische Dy	namik" (Chemical Dyna-	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its						
					ical kinetics and reaction dyna- cribing chemical reactions.		
Intend	ed learı	ning outcomes					
			nced topics in chemical k tion of chemical reaction		dynamics. They can describe me-		
Course	<b>S</b> (type, r	number of weekly contact ho	ours, language — if other than Ge	rman)			
S + Ü (	no infor	rmation on SWS (wee	kly contact hours) and co	ourse language avail	lable)		
		<b>sessment</b> (type, scope, la	anguage — if other than German,	examination offered — if no	ot every semester, information on whether		
		nation (90 minutes) o ssessment: German		e candidate each (20	o minutes) or talk (30 minutes)		
	ion of p						
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Modul	e appea	ars in					
Master	Master's degree (1 major) Chemistry (2013)						
AA L							

Master's degree (1 major) Chemistry (2010) Master's degree (1 major) Chemistry (2014) Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)



Module title					Abbreviation
Moder	n Synth	etic Methods		08-0CM-SYNT-141-m01	
Modul	e coord	inator		Module offered by	<u> </u>
lecture	r of the	seminar		Institute of Organic	Chemistry
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites	i	
1 seme	ster	graduate			
Conter	its				
		liscusses modern stere emistry and catalysis.	oselective synthesis m	ethods. It focuses o	n selected total syntheses, orga-
Intend	ed lear	ning outcomes			
They ca					stereochemically analyse them. chemistry and catalysis in synthe-
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Ge	rman)	
S + Ü (	no info	mation on SWS (weekl	y contact hours) and co	ourse language avai	lable)
		sessment (type, scope, lang le for bonus)	ruage — if other than German,	examination offered — if no	ot every semester, information on whether
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English					
Allocat	ion of p	olaces			
Additional information					
<del></del>					
Workload					
Teachi	ng cycl	е			
<del></del>					

Master's degree (1 major) Chemistry (2014)

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



Module	Module title Abbreviation						
Compu	tationa	l Chemistry	08-TCM2-141-m01				
Module	coord	inator		Module offered by	l.		
lecture	r of lect	ture "Computational Che	mistry"	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	numei	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
This mo	dule ir	ntroduces students to the	fundamental princip	oles of computationa	al chemistry.		
Intende	ed learr	ning outcomes					
Studen putatio			tical principles of co	mputational chemist	try and to apply methods in com-		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		<b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and len	utes) o g (appr igth of a	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	laces					
Additio	nal info	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						



Module title					Abbreviation
Polymer Chemistry					03-FU-PM1-141-m01
Module	e coord	inator		Module offered by	
	holder of the Chair of Functional Materials in Medicine and Dentistry			Faculty of Medicine	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duration Module level		Other prerequisites			
1 semester graduate					
Conton	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 are familiar with the fundamentals of polymer chemistry and the related methods for their characterisation.

**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.

- o3-FU-PM1-1-141: V (no information on SWS (weekly contact hours) and course language available)
- 03-FU-PM1-2-122: P (no information on SWS (weekly contact hours) and course language available)

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

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

#### **Assessment in module component 03-FU-PM1-1-141:** Polymer Chemistry (Lecture)

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

#### Assessment in module component 03-FU-PM1-2-122: Polymer Chemistry (Practical course)

- 2 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each) and logs (approx. 5 pages each)
- Assessment offered: once a year, summer semester

# • Language of assessment: German, English if agreed upon with the examiner Allocation of places **Additional information** Workload **Teaching cycle Referred to in LPO I** (examination regulations for teaching-degree programmes)



### Module appears in



## **Medicinal Chemistry**

(25 ECTS credits)



## **Compulsory Courses**

(10 ECTS credits)



Module title					Abbreviation		
Practic	Practical course medicinal chemistry				08-MCM1-102-m01		
Module	e coord	linator		Module offered by	l.		
lecture mistry)		rmazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
10	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its						
Selecte	ed metl	nods and topics in medic	inal chemistry (synth	esis, testing, analysi	is, theory, pharmacokinetics).		
Intend	ed lear	ning outcomes		·			
Studer	its have	e developed a knowledge	of medicinal chemis	stry and are able to a	pply it to practical experiments.		
Course	<b>S</b> (type, 1	number of weekly contact hours, l	anguage — if other than Ge	rman)	, , ,		
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	<u>e)</u>		
		sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
of prac	tical pe	e-experiment exams) and erformance, written repor assessment: German or E	t (approx. 30 to 50 pa		approx. 20 minutes), assessment		
Allocat	ion of	places					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	ed to in	LPO I (examination regulation:	s for teaching-degree progra	ummes)			
Module appears in							
	Master's degree (1 major) Chemistry (2013)						
Master	Master's degree (1 major) Chemistry (2010)						
	_	ee (1 major) Chemistry (2	•				
Master	Master's degree (1 major) FOKUS Pharmacy (2012)						



### **Compulsory Electives**

(ECTS credits)



Module title					Abbreviation	
Pharmaceutical/Medicinal Chemistry 1			l		08-MCM2a-141-m01	
Module	coord	inator		Module offered by		
lecture mistry)	rs Phar	mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade	-			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
structu in the n drug de	re-activ nodule evelopr	vity relationships; molecu ; drug analysis; drug syn nent: discussion of speci	ılar effect mechanisn thesis; biotransforma	ns; pharmacological	gies for active agent discovery; principles of the drugs discussed tics of individual drugs; history of	
		ning outcomes				
Studen	ts have	e developed a knowledge	of pharmaceutical/r	nedicinal chemistry.		
		number of weekly contact hours, l				
		tion on SWS (weekly cont				
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo	utes) o g (appı	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r	pprox. 30 minutes, §	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat		•				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation	
Pharma	aceutic	al/Medicinal Chemistry :	2		08-MCM2b-141-m01	
Module	coord	inator		Module offered by	-	
lecture mistry)	rs Phar	mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade	-			
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
structu in the n drug de	re-activ nodule evelopr	vity relationships; molecu ; drug analysis; drug syn nent: discussion of speci	ılar effect mechanisn thesis; biotransforma	ns; pharmacological	gies for active agent discovery; principles of the drugs discussed tics of individual drugs; history of	
		ning outcomes				
Studen	ts have	e developed a knowledge	of pharmaceutical/r	nedicinal chemistry.		
		number of weekly contact hours, l				
		tion on SWS (weekly cont				
		sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo	utes) o g (appı	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r	pprox. 30 minutes, §	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat		•				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation	
Princip	les of c	drug design			08-MCM3-132-m01	
Module	e coord	inator		Module offered by		
lecture mistry)		mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its					
cophor QSAR. gies, b	e mode Predict ioisoste	els, docking, virtual scree	ening, simulation met	hods, de novo desig	re-based drug design, pharma- rn. Ligand-based drug design. ase examples, prodrug strate-	
	-	ter the theoretical and ex	vnorimental methods	and acports of drug	docian	
		number of weekly contact hours,		· ·	uesigii.	
		rmation on SWS (weekly			ahle)	
Metho	d of ass	sessment (type, scope, langua			ot every semester, information on whether	
presen	tation v	le for bonus) with discussion (approx. ssessment: German or E				
Allocat	ion of p	olaces				
	1					
Additio	nal inf	ormation				
Worklo	ad					
			_			
Teachi	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	Module appears in					
	Master's degree (1 major) Chemistry (2013)					
Master	Master's degree (1 major) Chemistry (2014)					



Modul	Module title Abbreviation					
Clinica	l and A	nalytical Chemistry		08-PH-KAC-092-m01		
Modul	e coord	inator		Module offered by		
		ture "Klinisch-analytische   Chemistry)	e Chemie" (Clinical	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade	-			
Duration	on	Module level	Other prerequisites			
1 seme	ester	undergraduate				
Conter	nts					
This m	odule d	iscusses advanced topic	s in clinical analytica	l chemistry.		
Intend	ed lear	ning outcomes				
Studer	nts have	e developed an advanced	knowledge of molec	ular biology.		
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
V (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
			ge — if other than German,	examination offered — if no	t every semester, information on whether	
		le for bonus)				
	_	nation (120 minutes)				
Alloca	tion of p	olaces				
Additio	onal inf	ormation				
Worklo	oad					
	-					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
<del></del>						
	Module appears in					
I	Master's degree (1 major) Biochemistry (2012)					
	_	ee (1 major) Chemistry (2 ee (1 major) Chemistry (2				
	_	ee (1 major) Chemistry (2 ee (1 major) Chemistry (2				
	master 3 degree (1 major) Chemistry (2014)					



Module title				,	Abbreviation	
Clinica	l and A	nalytical Chemistry (prac	ctical course)		08-PH-KACP-092-m01	
Module	coord	inator		Module offered by		
		ture "Klinisch-analytische l Chemistry)	e Chemie" (Clinical	Institute of Pharma	cy and Food Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
This mo		overs practical topics in (	clinical chemistry and	d clinical diagnostics	s as well as the related analytical	
Intende	ed lear	ning outcomes				
Studen ments.	ts have	e developed a knowledge	of clinical analytical	chemistry and are a	ble to apply it to practical experi-	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
P (no in	format	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
examin	ation t	alks (Testate, approx. 15	minutes each), log (a	pprox. 5 to 10 pages	5)	
Allocat	ion of <sub>I</sub>	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master	Master's degree (1 major) Biochemistry (2012)					
	Master's degree (1 major) Chemistry (2013)					
	_	ee (1 major) Chemistry (2				
Master	Master's degree (1 major) Chemistry (2014)					



		/////	O MEONE ABILITY	, , , , , , , , ,		
Modul	Module title				Abbreviation	
Moder	Modern Synthetic Methods				08-OCM-SYNT-141-m01	
Modul	e coord	inator		Module offered by		
lecture	er of the	seminar	_	Institute of Organic	Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts					
		liscusses modern stereos emistry and catalysis.	selective synthesis m	ethods. It focuses o	n selected total syntheses, orga-	
Intend	ed lear	ning outcomes				
They c		ain total syntheses. They			stereochemically analyse them. chemistry and catalysis in synthe-	
Course	<b>es</b> (type, r	number of weekly contact hours,	anguage — if other than Ger	rman)		
S + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	lable)	
		sessment (type, scope, langua ble for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
30 min or d) lo and le	nutes) o og (appi ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, §	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	tion of p	places				
Additio	Additional information					
Workload						
Teachi	Teaching cycle					

Module appears in

Master's degree (1 major) Chemistry (2014)

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



Module title					Abbreviation	
Modern Aspects of Natural Product Chemistry and Biological Chemistry					08-OCM-NAT-141-m01	
Module	coordi	nator		Module offered by		
lecture	r of the	seminar		Institute of Organic	Chemistry	
ECTS	Metho	d of grading	Only after succ. com	npl. of module(s)		
5	numer	ical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
This mo	odule d	iscusses advanced topic	s in natural product o	themistry and biolog	gical chemistry.	
Intende	ed learr	ning outcomes				
Studen	ts are a	ble to discuss advanced	topics in natural pro	duct chemistry and	biological chemistry.	
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)		
S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	e)	
		<b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
30 minu or d) log and len	utes) or g (appr gth of a	rc) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocati	ion of p	laces				
Chemis	try Mas	ster's: no restrictions. Bio	ochemistry Master's:	20 places. Places wi	ill be allocated by lot.	
Additio	nal info	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master'	Master's degree (1 major) Chemistry (2014)					



Module title					Abbreviation	
Bioano	Bioanorganic Chemistry				08-ACM2-141-m01	
Module	e coord	inator		Module offered by		
and Me	edizinis	minar "Anorganische Aspo schen Chemie" (Inorganic edicinal Chemistry)		Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		,			
	ds of B				chemistry (BIC). It discusses the ns of BIC in the fields of diagnosis	
Intend	ed lear	ning outcomes				
		able to describe the princ us enzymes and describe			xplain the structure and effects medicine.	
Course	S (type, i	number of weekly contact hours, l	anguage — if other than Ger	rman)		
S (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
30 min or d) lo and ler	utes) o g (app ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type	
Allocat	ion of	places				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
<del></del>						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



Module	Module title Abbreviation					
Molecular Biology					08-BC-MOLM-141-m01	
Module	coord	inator		Module offered by		
holder	of the (	Chair of Biochemistry		Chair of Biochemist	try	
ECTS	Metho	od of grading	Only after succ. com	ipl. of module(s)		
5	numei	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Compri tional b			his module discusse	s advanced topics ir	n molecular physiology and func-	
Intende	ed learr	ning outcomes				
Studen	ts have	e developed a sound kno	wledge of molecular	biology.		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		<b>eessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
didate 30 min about t	each (a utes, gi he met	pprox. 20 minutes) or d)	oral examination in a nutes) or d) presenta sessment prior to the	groups of up to 3 car tion (approx. 30 min	or c) oral examination of one candidates (groups of 2: approx. nutes). Students will be informed	
Allocat						
Additio	nal info	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					



Modul	e title		Abbreviation					
Practical course Structural Biology for advanced students					08-BC-VPSB-141-m01			
Modul	e coord	inator		Module offered by				
holder of the Chair of Biochemistry				Chair of Biochemistry				
ECTS	Meth	od of grading	Only after succ. con	Only after succ. compl. of module(s)				
10	nume	rical grade	o8-BC-MOLP	o8-BC-MOLP				
Duration		Module level	Other prerequisites	Other prerequisites				
1 semester graduate								
Conter	nts							
This module discusses cloning and the expression of protein constructs for crystallisation. It teaches students the fundamental principles and techniques of crystallisation and crystal optimisation as well as crystallographic data collection.								
Intend	ed lear	ning outcomes						
Students have developed an understanding of the method of selecting protein constructs for crystallisation. They master fundamental skills and techniques for protein crystallisation as well as data collection and processing.								
Course	es (type, r	number of weekly contact ho	urs, language — if other than Ger	rman)				
P (no i	nformat	tion on SWS (weekly	contact hours) and cours	e language available	e)			
<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)								
log (approx. 20 pages) and talk (approx. 15 minutes) Language of assessment: German, English								
Allocation of places								
Additional information								
Additional information on module duration: block placement with a duration of a minimum of 40 working days.								
Workload								
Teaching cycle								

Module appears in

Master's degree (1 major) Chemistry (2014)

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



## **Supramolecular Chemistry**

(25 ECTS credits)

## **Compulsory Courses**

(10 ECTS credits)



Modul	e title		Abbreviation			
Suprar	molecu	lar Chemistry (Basics)			08-SCM1-102-m01	
Modul	e coord	linator		Module offered by		
lecturer of lecture "Organischen Chemie"				Faculty of Chemistry and Pharmacy		
ECTS	Meth	od of grading	Only after succ. compl. of module(s)			
5	nume	rical grade				
Duration		Module level	Other prerequisites	3		
1 semester		graduate				
Conter	ıts	,	,			
			•	•	ılar chemistry. It focuses on inter pramolecular polymers, coordi-	

nation polymers and networks, liquid crystals, self-assembly in aqueous media, synthetic ion channels and modern applications of supramolecular chemistry.

### **Intended learning outcomes**

Students are able to explain interactions between molecules demonstrating a high degree of expertise in the field as well as to describe the formation, structure and polymers of coordination compounds. They are able to describe the self-assembly of polymers in aqueous media as well as to identify the characteristics of synthetic ion channels. They can name modern applications of supramolecular chemistry.

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

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

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

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

--

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

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#### Module appears in

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Functional Materials (2012)



Module	e title			Abbreviation				
Supran	nolecul	ar Chemistry (Practical C	ourse)		08-SCM2-102-m01			
Module	e coord	inator		Module offered by				
lecturer of lecture "Supramolekularen Chemie (Organische Chemie/Physikalische Chemie)"				Faculty of Chemistry and Pharmacy				
ECTS	Metho	od of grading	Only after succ. compl. of module(s)					
5	(not)	successfully completed						
Duration Module level O			Other prerequisites					
1 seme	ster	graduate						
Conten	its							
This module gives students the opportunity to perform some of the key experiments in supramolecular chemistry. They will perform syntheses of host-guest complexes, dye aggregates and nanoparticles and use advanced analytical methods to characterise them.								
Intende	ed learı	ning outcomes						
		able to perform syntheses hem. They are able to pro			roscopic methods to analyse and hem microscopically.			
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ge	rman)				
P (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)			
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether			
		, logs (approx. 5 pages e ssessment: German or E						
Allocat	ion of p	olaces						
Additio	nal inf	ormation						
 Worklo	ad							
Teachi	ng cvcl							
Teaching cycle								
Referred to in LPO I (examination regulations for teaching-degree programmes)								
Module appears in								
Master's degree (1 major) Chemistry (2013)								
	Master's degree (1 major) Chemistry (2010)							
Master's degree (1 major) Chemistry (2014)								



### **Compulsory Electives**

(ECTS credits)

No less than one of the two modules o8-SCM3 or o8-PCM5 must be completed in the focus.



Madula sista							
Module title  Bioorganic Chemistry  08-SCM3-141-mo1							
Bioorganic Chemistry 08-SCM3-141-m01							
Module coordinator Module offered by							
lecturer of lecture "Bioorganische Cher Chemistry)	nie" (Bioorganic	Institute of Organic	: Chemistry				
ECTS Method of grading	Only after succ. con	npl. of module(s)					
5 numerical grade							
Duration Module level	Other prerequisites						
1 semester graduate							
Contents	,						
This module discusses topics at the interactions and recognition, molecins and carbohydrates.							
Intended learning outcomes							
Students are able to describe molecular can explain the molecular diversity of the can describe modern aspects of DNA, I Courses (type, number of weekly contact hours, I	piological systems. The RNA, proteins and car	ney can characterise bohydrates.					
S (no information on SWS (weekly cont			<u></u>				
Method of assessment (type, scope, langua module is creditable for bonus)							
a) written examination (approx. 90 to 1 30 minutes) or c) oral examination in g or d) log (approx. 20 pages) or e) prese and length of assessment prior to the c Language of assessment: German, Eng	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	groups of 3: approx. 40 minutes)				
Allocation of places							
Additional information							
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							



Module	Module title Abbreviation					
Physical chemistry of supramolecular assemblies 08-PCM5-141-mo1					08-PCM5-141-m01	
Module	Module coordinator			Module offered by	I.	
lecture kularer		e seminar "Physikalische uren"	Chemie Supramole-	Institute of Physica	l and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conten	ts					
		examines the basic intera of aggregates as well as			he formation and physical-cheministry.	
Intende	ed lear	ning outcomes				
in the f dern ap	ield. Th	ney can describe the form ions of supramolecular ch	ation and physical-c nemistry.	hemical properties o	trating a high degree of expertise of aggregates. They can name mo-	
		number of weekly contact hours, l rmation on SWS (weekly o			abla)	
	-	·	•		ot every semester, information on whether	
		ole for bonus)	ge — II other than German,	exammation onered — ii no	or every semester, information on whether	
(approx	x. 30 m	nation (approx. 90 minut iinutes) issessment: German, Eng		on of one candidate	each (approx. 20 minutes) or talk	
Allocat	ion of	places				
Additio	nal inf	ormation				
	·					
Worklo	ad					
<del></del>						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master	Master's degree (1 major) Chemistry (2014)					



Module title Abbreviation					Abbreviation		
Bioanorganic Chemistry 08-ACM2-141-m01					08-ACM2-141-m01		
Module	Module coordinator Module offered by						
and Me	edizinis	minar "Anorganische Aspo schen Chemie" (Inorganic edicinal Chemistry)		Institute of Inorgan	ic Chemistry		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts		,				
	ds of B				chemistry (BIC). It discusses the ns of BIC in the fields of diagnosis		
Intend	ed lear	ning outcomes					
		able to describe the princ us enzymes and describe			xplain the structure and effects medicine.		
Course	S (type, i	number of weekly contact hours, l	anguage — if other than Ger	rman)			
S (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)		
		<b>sessment</b> (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether		
30 min or d) lo and ler	utes) o g (app ngth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) will be informed about the type		
Allocat	ion of	places					
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
<del></del>							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						
Master	Master's degree (1 major) Chemistry (2014)						



Module	Module title Abbreviation					
Princip	les of o	drug design			o8-MCM3-132-mo1	
Module	Module coordinator			Module offered by	I.	
lecture mistry)		mazeutische Chemie (Ph	armaceutical Che-	Institute of Pharma	cy and Food Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ıts					
cophor QSAR. gies, b	re mode Predict ioisoste	els, docking, virtual scree ions of pharmacokinetic erism, SAR.	ning, simulation met	hods, de novo desig	ure-based drug design, pharmagn. Ligand-based drug design. ase examples, prodrug strate-	
	-	ning outcomes				
		ter the theoretical and ex		,	g design.	
		number of weekly contact hours, l				
		rmation on SWS (weekly	•			
		<b>sessment</b> (type, scope, langua <sub>l</sub> le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
		with discussion (approx. ssessment: German or E				
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
	_					
Worklo	ad					
Teachi	Teaching cycle					
<del></del>						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
<del>-</del>						
	Module appears in					
	Master's degree (1 major) Chemistry (2013)					
Master	Master's degree (1 major) Chemistry (2014)					



Module	Module title Abbreviation						
Compu	Computational Chemistry 08-TCM2-141-mo1						
Module	coord	inator		Module offered by			
lecture	r of lect	ture "Computational Che	mistry"	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
This mo	odule ir	ntroduces students to the	e fundamental princip	oles of computationa	al chemistry.		
Intende	ed learı	ning outcomes					
Studen putatio			etical principles of co	mputational chemist	try and to apply methods in com-		
Course	<b>S</b> (type, n	number of weekly contact hours, l	anguage — if other than Ger	rman)			
S + Ü (r	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	t every semester, information on whether		
30 minutes or d) log and len	utes) o g (appr igth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 r course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	Workload						
Teachir	Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						



Module coordinator ecturer of the seminar "Organische Funktionsmaterialien" Institute of Organic Chemistry  ECTS Method of grading Only after succ. compl. of module(s) numerical grade Duration Module level Other prerequisites L semester graduate  Contents  The module deals with specific topics in organic functional materials. The focus is on fundamental (photo) physical effects in organic molecular and polymeric semiconductors as well as their application in (opto) electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in ninear optics.  Intended learning outcomes  The students are able to explain fundamental (photo) physical processes in organic semiconductors. He/She c explain the synthesis of these semiconductor materials as well as their application in (opto) electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlear optics.  Courses (type, number of weekly contact hours, language — if other than German)  6 (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 whethe module is creditable for bonus)  a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.	Module title Abbreviation					
Contents  The module deals with specific topics in organic functional materials. The focus is on fundamental (photo)physical effects in organic module as shell as field effect transistors, organic light-emitting diodes, or organic soal cells as well as in noil in the synthesis of these semiconductor materials as well as their application in (opto)electronic explain the synthesis of these semiconductor materials as well as their application in (opto)electronic explain the synthesis of these semiconductor materials as well as their application in (opto)electronic explain the synthesis of these semiconductor materials as well as their application in (opto)electronic explain the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlear optics.  Courses (type, number of weekly contact hours, language — if other than German)  6 (no information on SWS (weekly contact hours) and course language available)  Wethod of assessment (type, scope, language — if other than German, examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment; German, English	Organic Functional Materials				08-OCM-FM-141-m01	
Nethod of grading only after succ. compl. of module(s)  numerical grade  Duration Module level Other prerequisites  Is semester graduate  Contents  The module deals with specific topics in organic functional materials. The focus is on fundamental (photo)physical effects in organic molecular and polymeric semiconductors as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in minear optics.  Intended learning outcomes  The students are able to explain fundamental (photo)physical processes in organic semiconductors. He/She caxplain the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlinear optics.  Courses (type, number of weekly contact hours, language — if other than German)  So (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 whethe module is creditable for bonus)  a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment: German, English	Modul	e coord	linator		Module offered by	y
Duration Module level Other prerequisites  It semester graduate  Contents  The module deals with specific topics in organic functional materials. The focus is on fundamental (photo)physical effects in organic molecular and polymeric semiconductors as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in minerar optics.  Intended learning outcomes  The students are able to explain fundamental (photo)physical processes in organic semiconductors. He/She coexplain the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlinear optics.  Courses (type, number of weekly contact hours, language — if other than German)  So (no information on SWS (weekly contact hours) and course language available)  Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)  a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment; German, English	lecture	r of the	e seminar "Organische Fu	ınktionsmaterialien"	Institute of Organ	ic Chemistry
Duration Module level graduate	ECTS	Meth	od of grading	Only after succ. con	pl. of module(s)	
Contents  The module deals with specific topics in organic functional materials. The focus is on fundamental (photo)physical effects in organic molecular and polymeric semiconductors as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in neinear optics.  Intended learning outcomes  The students are able to explain fundamental (photo)physical processes in organic semiconductors. He/She cexplain the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlinear optics.  Courses (type, number of weekly contact hours, language — if other than German)  So (no information on SWS (weekly contact hours) and course language available)  Wethod 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 (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes and length of assessment prior to the course.  Language of assessment: German, English	5	nume	rical grade			
Contents  The module deals with specific topics in organic functional materials. The focus is on fundamental (photo)physical effects in organic molecular and polymeric semiconductors as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in no inear optics.  Intended learning outcomes  The students are able to explain fundamental (photo)physical processes in organic semiconductors. He/She composed by the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlinear optics.  Courses (type, number of weekly contact hours, language — if other than German)  So (no information on SWS (weekly contact hours) and course language available)  Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)  a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes and length of assessment prior to the course.  Language of assessment: German, English	Duratio	on	Module level	Other prerequisites		
The module deals with specific topics in organic functional materials. The focus is on fundamental (photo)physical effects in organic molecular and polymeric semiconductors as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in national n	1 seme	ster	graduate			
sical effects in organic molecular and polymeric semiconductors as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes, or organic solar cells as well as in neinear optics.  Intended learning outcomes  The students are able to explain fundamental (photo)physical processes in organic semiconductors. He/She caxplain the synthesis of these semiconductor materials as well as their application in (opto)electronic components such as field effect transistors, organic light-emitting diodes or in organic photovoltaics as well as in nonlinear optics.  Courses (type, number of weekly contact hours, language — if other than German)  So (no information on SWS (weekly contact hours) and course language available)  Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)  a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English	Conten	its	,	,		
Courses (type, number of weekly contact hours, language — if other than German)  S (no information on SWS (weekly contact hours) and course language available)  Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)  a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English	The stu explair ents su	idents the sy ich as f	are able to explain fundanthesis of these semico	nductor materials as v	vell as their applic	ation in (opto)electronic compon-
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 (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English			number of weekly contact hours	Janguago — if other than Go	man)	
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 (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English						ole)
a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English	Metho	d of as	sessment (type, scope, langu			
go minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English						
Allocation of places	a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English					

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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)

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#### Module appears in



Module title					Abbreviation
Nanoscale Materials					08-PCM3-102-m01
Module coordinator				Module offered by	
lecture	lecturer of the seminar "Nanoskalige Materialien"			Institute of Physical and Theoretical Chemistry	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	Duration Module level		Other prerequisites		
1 seme	1 semester graduate				
Conten	Contents				

This module discusses advanced topics in nanoscale materials. It focuses on the structure, properties, fabrication, modern characterisation methods and application areas of nanoscale materials.

#### **Intended learning outcomes**

Students are able to characterise nanoscale materials. They are able to name analytical methods and application areas of nanoscale materials.

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

S + 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)

written examination (90 minutes) or oral examination of one candidate each (20 minutes) or talk (30 minutes) Language of assessment: German or English

#### Allocation of places

#### **Additional information**

#### Workload

#### **Teaching cycle**

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

#### Module appears in

Bachelor' degree (1 major) Nanostructure Technology (2010)

Bachelor' degree (1 major) Nanostructure Technology (2012)

Master's degree (1 major) Chemistry (2013)

Master's degree (1 major) Chemistry (2010)

Master's degree (1 major) Chemistry (2014)

Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Computational Mathematics (2012)

Master's degree (1 major) Functional Materials (2012)



# **Theoretical Chemistry**

(25 ECTS credits)



# **Compulsory Courses**

(10 ECTS credits)



Module	Module title Abbreviation						
Theoretical Chemistry (Basics) 08-TCM1-141-mo1							
Module	coord	inator	Module offered by	<u>I</u>			
lecture	r of lect	ture "Theoretische Chem	ie"	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. com	ıpl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
This mo	odule ir	ntroduces students to the	e fundamental princip	oles of theoretical ch	nemistry.		
Intende	ed lear	ning outcomes					
		able to describe the math		al principles underly	ing the quantum chemical and		
Course	<b>S</b> (type, r	number of weekly contact hours, I	anguage — if other than Ger	man)			
S + Ü (r	no infor	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)		
		sessment (type, scope, langua	ge — if other than German, e	examination offered — if no	ot every semester, information on whether		
30 min or d) lo and ler	utes) o g (appr igth of	r c) oral examination in g	roups (groups of 2: a entation (approx. 30 n course.	pprox. 30 minutes, g	e candidate each (approx. 20 to groups of 3: approx. 40 minutes) vill be informed about the type		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	Workload						
	<del></del>						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	Module appears in						



Module title Abbreviation						
Programming in Theoretical Chemistry					08-TCM3-102-m01	
Module coordinator				Module offered by	I.	
lecture mie"	r of lect	ture "Programmieren in	Theoretischer Che-	Institute of Physica	al and Theoretical Chemistry	
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites	}		
1 seme	ster	graduate				
Conten		0				
		provides an introduction ation areas.	to the fundamentals	of programming in th	neoretical chemistry and discus-	
Intende	ed lear	ning outcomes				
		able to explain and use name its application are		ng languages typica	lly used in theoretical chemistry	
Course	<b>S</b> (type, r	number of weekly contact hours	s, language — if other than Ge	rman)		
S + Ü (r	no infor	rmation on SWS (weekly	y contact hours) and c	ourse language avai	lable)	
		sessment (type, scope, lang	uage — if other than German,	examination offered — if n	ot every semester, information on whether	
		nd discussion of approx ssessment: German or		ises as well as talk (	(approx. 45 minutes)	
Allocat	ion of p	olaces	,			
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cvcl	 P				
	is cycl	<u> </u>				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progr	ammes)		
	<u>.u to iii</u>	LI O I (examination regulation		diffines)		
Modula	annes	ars in				
	Module appears in  Master's degree (1 major) Chemistry (2013)					
	Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2010)					
	Master's degree (1 major) Chemistry (2014)					
	_	ee (1 major) Mathemati	•			
Master	's degr	ee (1 major) Mathemati	cs (2010)			
laster	aster's degree (1 major) Mathematics (2010)					

Master's degree (1 major) Computational Mathematics (2012)



### **Compulsory Electives**

(ECTS credits)



Module title Abbreviation							
Theore	Theoretical Chemistry - Project course wave-packet dynamics 08-TCAP1-132-mo1						
Modul	Module coordinator Mo				I.		
head o	of the re	search group offering the	e module	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	·		
5	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ester	graduate					
Conter	nts						
the Ins	stitute o				f the research groups based at ised in the discipline. The focus		
Intend	ed lear	ning outcomes					
		e learned some of the me lics. They are able to expl			stry and, in particular, in wave f wave packet dynamics.		
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)			
P (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
•		(approx. 30 minutes) ssessment: German or E	nglish				
Alloca	tion of p	olaces					
Additio	onal inf	ormation					
Additio	onal inf	ormation on module dura	ation: 4 weeks.				
Workload							
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
	-						

Module appears in

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



Modul	Abbreviation Abbreviation						
Theoretical Chemistry - Project coursewave function based methods 08-TCAP2-132-mo1							
Modul	e coord	inator		Module offered by			
head o	f the re	search group offering the	e module	Institute of Physica	l and Theoretical Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not)	successfully completed					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conter	ıts						
the Ins	titute o				f the research groups based at sed in the discipline. The focus		
Intend	ed lear	ning outcomes					
					stry and, in particular, in wave of wave function methods.		
Course	<b>S</b> (type, r	number of weekly contact hours,	anguage — if other than Ger	rman)			
P (no i	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	e)		
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
•		approx. 30 minutes) ssessment: German or E	nglish				
Allocat	tion of p	olaces					
Additio	onal inf	ormation	•				
Additio	nal info	ormation on module dura	ition: 4 weeks.				
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							

Module appears in

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



Module title Abbreviation						
Theoretical Chemistry - Project course Computational Photochemistry 08-TCAP3-132-m01						
Module	coordinator		Module offered by			
head of	the research group offering the	e module	Institute of Physica	l and Theoretical Chemistry		
ECTS	Method of grading	Only after succ. con	npl. of module(s)			
5	(not) successfully completed					
Duratio	n Module level	Other prerequisites				
1 semes	ster graduate					
Conten	ts	•				
the Inst	odule gives students the opport itute of Theoretical Chemistry a on theoretical photochemistry.			f the research groups based at seed in the discipline. The focus		
Intende	ed learning outcomes					
				stry and, in particular, in theoreti- of theoretical photochemistry.		
Course	<b>S</b> (type, number of weekly contact hours,	language — if other than Ger	rman)			
P (no in	formation on SWS (weekly con	tact hours) and cours	e language available	e)		
	of assessment (type, scope, langua creditable for bonus)	age — if other than German, o	examination offered — if no	ot every semester, information on whether		
	tation (approx. 30 minutes) ge of assessment: German or E	nglish				
Allocati	ion of places					
Additio	nal information					
Additio	nal information on module dura	ation: 4 weeks.				
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						

Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Chemistry (2014)



Module	Module title Abbreviation						
Computational Chemistry 08-TCM2-141-mo1					08-TCM2-141-m01		
Module	e coord	inator		Module offered by			
lecture	r of lect	ture "Computational Che	mistry"	Institute of Physical and Theoretical Chemistry			
ECTS	Metho	od of grading	Only after succ. con				
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	its		,				
This m	odule ir	ntroduces students to the	e fundamental princip	oles of computationa	al chemistry.		
Intend	ed learı	ning outcomes					
		able to explain the theore	etical principles of co	mputational chemist	try and to apply methods in com-		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
S + Ü (ı	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
<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) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2: approx. 30 minutes, groups of 3: approx. 40 minutes) or d) log (approx. 20 pages) or e) presentation (approx. 30 minutes). Students will be informed about the type and length of assessment prior to the course.  Language of assessment: German, English							
Allocation of places							
Additional information							
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
modute appears in							



Module	e title				Abbreviation	
Princip	les of d	lrug design			08-MCM3-132-m01	
Module	e coord	inator		Module offered by	<u> </u>	
	lecturers Pharmazeutische Chemie (Pharmaceutical Chemistry)			Institute of Pharmacy and Food Chemistry		
ECTS	Metho	od of grading	Only after succ. compl. of module(s)			
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate	-			
Conten	ıts					
cophor QSAR. gies, b	turally occurring substances. Theoretical methods: molecular modelling, structure-based drug design, pharma-cophore models, docking, virtual screening, simulation methods, de novo design. Ligand-based drug design. QSAR. Predictions of pharmacokinetic and toxicological components (ADME). Case examples, prodrug strategies, bioisosterism, SAR.					
Intend	ed learı	ning outcomes				
Studer	its mas	ter the theoretical and ex	perimental methods	and aspects of drug	design.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S + Ü (ı	no infor	mation on SWS (weekly o	contact hours) and co	urse language avail	able)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
		vith discussion (approx. ssessment: German or E				
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
	Master's degree (1 major) Chemistry (2013)					
Master	Master's degree (1 major) Chemistry (2014)					



# Key Area 1 (double degree)

(30 ECTS credits)



# Key Area 2 (double degree)

(25 ECTS credits)



# Courses at partner university abroad

(30 ECTS credits)



Modul	Module title Abbreviation					
Courses at the partner university					08-VPU-141-m01	
Modul	e coord	inator		Module offered by		
progra	mme co	oordinator of the exchang	ge programme	Faculty of Chemistry and Pharmacy		
ECTS	Metho	od of grading	Only after succ. con			
30	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
2 seme	ester	graduate	Please consult with course advisory service.			
Conter	nts	. =				
This m	odule d	iscusses topics from the	curriculum of the par	rtner university abro	ad.	
Intend	ed lear	ning outcomes		·		
		-	ge and skills taught i	n the courses attenc	led by them at the partner univer-	
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
V (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
assessment or successful completion as certified by the lecturer; methods of assessment: a) written examination (approx. 90 to 180 minutes) or b) oral examination of one candidate each (approx. 20 to 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes); students will be informed about the method and length of the assessment prior to the course Language of assessment: German or English						
Allocation of places						
Additio	onal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Modul	Module appears in					
Master	Master's degree (1 major) Chemistry (2013)					



### **Thesis**

(30 ECTS credits)



Modul	e title				Abbreviation	
Master-Thesis					08-MA-132-m01	
Module coordinator				Module offered by		
degree programme coordinator Chemie (Chemistry)			e (Chemistry)	Faculty of Chemistry and Pharmacy		
ECTS	ECTS Method of grading O		Only after succ. con	succ. compl. of module(s)		
30	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i		
1 seme	ester	graduate	Where applicable, specific modules as specified by supervisor.			
Conten	nts					
		rives students the opport scientific methods they			problem within a given time frame	
Intend	ed lear	ning outcomes				
Students are able to conduct research on a defined problem/topic, adhering to the principles of good scientific practice, and to present the results of their work in written form.						
Course	es (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
no cou	rses as	signed				
<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 thesis (approx. 60 to 80 pages) Language of assessment: German or English						
Allocation of places						
Additional information						
Additional information on module duration: 6 months.						
Workload						
<u></u>						
Teaching cycle						

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Module appears in

Master's degree (1 major) Chemistry (2013)

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