

# Subdivided Module Catalogue for the Subject

# FOKUS Chemistry

as a Bachelor's with 1 major with the degree "Bachelor of Science" (180 ECTS credits)

Examination regulations version: 2011 Responsible: Faculty of Chemistry and Pharmacy

JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record 82|f78|-|-|H|2011



# **Course of Studies - Contents and Objectives**

No translation available.

# Abbreviations used

Course types:  $\mathbf{E}$  = field trip,  $\mathbf{K}$  = colloquium,  $\mathbf{O}$  = conversatorium,  $\mathbf{P}$  = placement/lab course,  $\mathbf{R}$  = project,  $\mathbf{S}$  = seminar,  $\mathbf{T}$  = tutorial,  $\ddot{\mathbf{U}}$  = exercise,  $\mathbf{V}$  = lecture

Term: **SS** = summer semester, **WS** = winter semester

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

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

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

# Conventions

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

# Notes

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

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

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

# In accordance with

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

# ASP02009

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

# 29-Aug-2011 (2011-71)

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.

# The subject is divided into

Abbreviation	Module title	ECTS credits	Method of grading	pag
Compulsory Courses (19	o ECTS credits)			
General and Inorganic	Chemistry (47 ECTS credits)			
08-AC1-102-m01	Inorganic Chemistry 1	21	NUM	6
08-AC2-102-m01	Inorganic Chemistry 2	6	NUM	8
08-AC3-102-m01	Inorganic Chemistry 3	9	NUM	9
08-AS1-102-m01	Chemistry of the Elements and Analytical Chemistry	11	NUM	11
Organic Chemistry (39	ECTS credits)		1	
08-0C1-092-m01	Organic Chemistry 1	5	NUM	18
08-0C2-102-m01	Organic Chemistry 2	9	NUM	2
08-0C3-102-m01	Organic Chemistry 3	15	NUM	2
08-0C4-102-m01	Organic Chemistry 4	10	NUM	2.
	cal Chemistry (38 ECTS credits)		I	
08-PC1-092-m01	Physical Chemistry 1	8	NUM	2
08-PC2-092-m01	Physical Chemistry 2: Thermodynamics, Kinetics, Electroche- mistry	18	NUM	2
08-PC3-092-m01	Physical and Theoretical Chemistry 3: Symmetry and Quantum Chemistry	6	NUM	3'
08-PC4-092-m01	Physical Chemistry 4: Statistical Thermodynamics	3	NUM	3
08-TC-092-m01	Theoretical Models in Chemistry	3	NUM	3
Basics of Natural Scien	nces (21 ECTS credits)	-	Į	
08-BC-092-m01	Biochemistry	6	NUM	1.
10-M-MCB-101-m01	Mathematics for students in Chemistry and Biology	5	NUM	3
11-EFNF-072-m01	Introduction to Physics for Students of Non-physics-related Mi- nor Subjects	7	NUM	3
11-PFNF-072-m01	Practical Course Physics for Students of Non-physics-related Minor Subjects	3	B/NB	4
Scientific Discussion (	5 ECTS credits)			
08-WD-FO- KUS-112-m01	Scientific Discussion	5	NUM	3
Thesis (10 ECTS credits)	· · · · · · · · · · · · · · · · · · ·			
08-BA-FOKUS-112-m01	Bachelor Thesis FOKUS Chemistry	10	NUM	1
ubject-specific Key Skil	ls (17 ECTS credits)		1	
Compulsory Courses (8	ECTS credits)			
03-TR-072-m01	Toxicology and legal studies	3	NUM	5
08-PKC-102-m01	Programming course for Chemistry Major	5	B/NB	3
Compulsory Electives (g	ECTS credits)			
08-FOP-112-m01	Advanced research lab course	9	B/NB	1
08-FAP-112-m01	FOKUS Foreign Studies	9	B/NB	1
08-FIP-112-m01	FOKUS Industrial work experience	9	B/NB	16

Module	Module title Abbreviation					
Toxico	logy an	d legal studies			03-TR-072-m01	
Module	e coord	inator		Module offered by		
lecture	r of lect	ture "Toxikologie und Re	chtskunde"	Faculty of Medicine		
ECTS	1	od of grading	Only after succ. con	,		
3	1	rical grade				
Duratio		Module level	Other prerequisites			
1 seme		undergraduate				
Conten	ts	U U				
Basics toxicol	-	l regulations for chemist	s (handling and trans	portation of hazardo	us materials), funda	mentals of
Intend	ed lear	ning outcomes				
		master the basics of lega the fundamentals of to		nists (handling and t	ransport of hazardou	us substan-
Course	s (type	, number of weekly conta	act hours, language –	· if other than Germa	n)	
		mation on SWS (weekly				
		essment (type, scope, la on on whether module o			tion offered — if not	every seme-
written	exami	nation (approx. 90 minu	tes)			
Allocat	ion of r	olaces				
Additio	nal inf	ormation				
Additio	nat ini					
 Workla						
WORKIO	au					
 Taashii		•				
Teachi	ig cyci	e				
Referre		LPO I (examination reg	liations for teaching-o	legree programmes)		
 Maduli		and in				
Module			m. (2211)			
	-	ree (1 major) Biochemist				
	-	ree (1 major) Biochemist ree (1 major) Biochemist				
	-	ree (1 major) Chemistry (				
	-	ree (1 major) Chemistry (				
	-	ree (1 major) Chemistry (				
	-	ree (1 major) Chemistry (				
	-	ree (1 major) Food Chem				
	-	ree (1 major) FOKUS Che				
	-	ee (1 major) Chemistry (2	•			
	-	ee (1 major) Chemistry (2				
	-	ee (1 major) Chemistry (2				
	-	mination for the teachin		e Chemistry (2009)		
		mination for the teachin				
		mination for the teachin	,			
		mination for the teachin				
		mination for the teachin				
		or FOKUS Chemistry (2011)		generated 26-Aug-2024 • ex	am. reg. da-	page 5 / 41
				relor (180 ECTS) FOKUS Chem		

Module	e title		Abbreviation					
Inorga	nic Che	mistry 1			08-AC1-102-m01			
Module	e coord	inator		Module offered by				
lecture Chemis		ture "Experimentalchen	nie" (Experimental	Institute of Inorganic Chemistry				
ECTS	Methe	od of grading	Only after succ. con	npl. of module(s)				
21	nume	rical grade						
Duration Module level			Other prerequisites					
1 semester undergraduate			By way of exception assessments.	, additional prerequi	isites are listed in th	e section on		
Conten	Contents							
les, me module exercis autono ques, t	This module provides students with an overview of the fundamental principles of chemistry. It focuses on partic- les, metals, acid-base reactions, the periodic table, chemical equilibrium and complexometry. In addition, the module introduces fundamental models of chemistry and principles of inorganic chemistry. It includes practical exercises based on the lecture on experimental chemistry and its extension. After a safety briefing, the students autonomously conduct experiments in the laboratory. The course focuses on laboratory safety, simple lab techni- ques, the synthesis of simple substances and analyses of unknown substances. In addition, students have the opportunity to advance their laboratory knowledge.							
		ning outcomes	<u> </u>					
le to ex mical f are abl are abl loped t	Students are able to explain the principles of the periodic table and to extract information from it. They are ab- le to explain basic models of the structure of matter. They have developed the ability to use the language of che- mical formulas to describe chemical reactions and to interpret them by identifying the type of reaction. Students are able to describe the main quantitative and qualitative analytical methods and their application areas. They are able to identify fundamental problems in chemistry and perform experiments to solve them. They have deve- loped the ability to perform the necessary stoichiometric calculations and describe the chemical processes in an appropriate manner, both in written and oral form.							
Course	<b>s</b> (type	, number of weekly con	tact hours, language –	- if other than Germa	n)			
• c • c	08-AC1- 08-AC1- 08-AC1-	as 4 components; info 1-102: V + V + Ü (no info 2-102: P (no informatio 3-102: V (no informatio 4-102: P (no informatio	ormation on language a n on language and nur n on language and nur	and number of weekl nber of weekly conta nber of weekly conta	y contact hours avai ct hours available) ct hours available)	lable)		
		sessment (type, scope, ion on whether module			tion offered — if not	every seme-		
					ise, students must p	bass all of		
mistry • 6 • p • A • L • 0 • 4 • 5 sion of • 4 • a • e • L	<ul> <li>pre/post-experiment examination talks (Vor-/Nachtestate, approx. 15 minutes each), log (approx. 5 to 10 pages)</li> <li>Assessment offered: once a year, winter semester</li> <li>Language of assessment: German, English</li> <li>Only after successful completion of module components: Module component o8-AC1-2 can only be taken by students who successfully completed module component o8-AC1-4.</li> <li>Assessment in module component o8-AC1-3-102: Erläuterungen zum Praktikum Anorganische Chemie 1 (Discussion of Experiments Performed in Lab Course Inorganic Chemistry 1)</li> <li>4 ECTS credits, numerical grading</li> <li>a) 1 to 3 written examinations (approx. 45, 60 or 90 minutes each) or x) oral examination of one candidate each (approx. 20 minutes) or x) oral examination in groups of 2 candidates (approx. 30 minutes total)</li> <li>Language of assessment: German, English</li> </ul>							
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**Assessment in module component o8-AC1-4-102:** Sicheres Arbeiten in chemischen Laboratorien (Chemical Laboratory Safety)

- 1 ECTS credit, pass / fail
- Assessment of practical assignments
- Language of assessment: German, English

**Assessment in module component o8-AC1-1-102:** Grundlagen der Allgemeinen und Anorganischen Chemie (Fundamental Principles of General and Inorganic Chemistry)

- 10 ECTS credits, numerical grading
- a) 1 to 3 written examinations (1 written examination: approx. 90 minutes, 2 written examinations: 60 minutes or 90 minutes each, 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups of 2 candidates (approx. 30 minutes)
- Language of assessment: German or English
- Additional prerequisites: admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually no more than 2 incidents of unexcused absence).

Allocation of places

Additional information

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Workload

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Teaching cycle

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

§ 42 (1) 1. Chemie "Allgemeine und Anorganische Chemie" und "Physikalische und Analytische Chemie" § 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"

#### Module appears in

Module title Abbreviation						
Inorgar	nic Che	mistry 2		08-AC2-102-m01		
Module	e coord	inator		Module offered by		
lecturer of lecture "Festkörperchemie" (Solid State Che- mistry)			(Solid State Che-	Institute of Inorgani	c Chemistry	
ECTS		thod of grading Only after succ. compl. of module(s)				
6	5 numerical grade					
Duration Module level Other prerequisites						
1 seme	ster	undergraduate				
Conten	ts					
		quips students with an a ures and properties, spec			saline compounds. It focuses ical processes.	
Intende	ed learı	ning outcomes				
priate r	nanner bic metl	. They are able to system	ise them and charact	terise their structure	saline compounds in an appro- and reactivity. They can list spec- describe them in an appropriate	
Course	<b>s</b> (type	, number of weekly conta	ct hours, language —	- if other than Germa	n)	
V + V (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language availa	able)	
		s <b>essment</b> (type, scope, la on on whether module ca			tion offered — if not every seme-	
or 90 m each (a	ninutes pprox.		tions: approx. 60 min amination in groups	nutes each) or b) oral	ten examinations: approx. 60 examination of one candidate . 30 minutes)	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	6				
Referre	d to in	LPOI (examination regu	lations for teaching-o	degree programmes)		
Module	e appea	urs in				
		ree (1 major) Chemistry (2	2010)			
	-	ree (1 major) FOKUS Chen				

Inorga	e title			·	Abbreviation	
	nic Che	emistry 3			08-AC3-102-m01	
Module coordinator				Module offered by		
		ture "Elementorganische	Chemie" (Flemental	-	ic Chemistry	
Organi		-				
ECTS	Meth	od of grading	Only after succ. con	Only after succ. compl. of module(s)		
9	nume	rical grade	08-AC1 (module cor	ule component o8-AC1-4 only) and o8-OC3 (module comp		
	nent 08-OC3-2 only)					
Duration Module level			Other prerequisites			
1 seme	ster	undergraduate		, additional prerequ	isites are listed in the section or	
	assessments.					
Conten	lts		_			
propert tunity t handlir	ties, sp to do so ng of o	oecial material classes, re ome autonomous researc	eactivity and technica ch and plan and cond s, their synthesis and	l processes. The mo uct complex synthes	It focuses on their structures and dule gives students the oppor- ses. The course focuses on the ctive atmospheres. Spectroscop	
	-	ning outcomes				
researc in oral out the	ch and and wr synth	perform experiments to s itten form using appropri esis of a substance using	solve complex problem iate scientific termino advanced lab techni	ms. They are able to logy. They are able t ques.	s are able to conduct autonomou describe the technical principles to independently plan and carry	
Course	<b>s</b> (type	, number of weekly conta	act hours, language –	- if other than Germa	an)	
compo	nent.	comprises 2 module com	nononte Information			
		-1-102: V + Ü (no informat -2-102: P (no information	tion on SWS (weekly o	contact hours) and c	ourse language available)	
• o Metho	08-AC3	-2-102: P (no information	tion on SWS (weekly o on SWS (weekly cont anguage — if other the	contact hours) and c act hours) and cours an German, examina		
• c <b>Metho</b> ster, in Assess low. Ur vidual	o8-AC3 d of as format iment i nless s assess	-2-102: P (no information sessment (type, scope, la ion on whether module c n this module comprises tated otherwise, success ments.	tion on SWS (weekly o on SWS (weekly cont anguage — if other the an be chosen to earn the assessments in t ful completion of the	contact hours) and c act hours) and cours an German, examina a bonus) he individual modul module will require	ourse language available) se language available)	

#### 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

Chemi	Module title Abbreviation						
CHCHH	istry of	the Elements and Analyti	cal Chemistry		08-AS1-102-m01		
Modul	le coorc	linator		Module offered by			
lecturer of lecture "Chemie der Hauptgruppenelemen- te" (Chemistry of Main-group Elements)				Institute of Inorgan	ic Chemistry		
ECTS	Meth	od of grading	Only after succ. com	npl. of module(s)			
11	nume	erical grade	08-AC1 (module con	component o8-AC1-4 only) and o8-OC3 (module com			
			nent o8-0C3-2 only)	only)			
Durati	ion	Module level	Other prerequisites	25			
1 seme	ester undergraduate						
Conte	nts						
on, it i modul lecture	introduo le gives e(s). Aft	ces students to elementa students the opportunity	ry organic chemistry, v to apply in practice t tudents autonomousl	coordination chemis the knowledge they ly conduct experime	structure of elements. In additi- stry and complex chemistry. The have gained through the related nts in the laboratory. These expe		
Intend	led lear	ning outcomes					
how to lyse u	o use th nknowr		ntial tool for chemists they are able to sepa	s. Students are able arate and analyse m			
compo •	onent. 08-AN1 08-AS1	-2-102: P (no information 1-102: V + V (no informat	on SWS (weekly cont ion on SWS (weekly c	act hours) and cours ontact hours) and co	ourse language available)		
		ion on whether module c			ition offered — if not every seme		
low. U		tated otherwise, successf			e components as specified be- successful completion of all indi		
٥		n module component o8-					
	<ul> <li>5 ECTS, Method of grading: (not) successfully completed</li> <li>Vortestate (pre-experiment exams), assessment of practical performance, Nachtestate (post-experiment exams), log (5 to 10 pages)</li> <li>Assessment offered: once a year, summer semester</li> </ul>						
•	exams) Assessi	ate (pre-experiment exam , log (5 to 10 pages) ment offered: once a year	successfully complet is), assessment of pra , summer semester	ted	Nachtestate (post-experiment		
Asses	exams) Assessi Langua <b>sment i</b> 6 ECTS, a) 1 to 3	ate (pre-experiment exam , log (5 to 10 pages) ment offered: once a year ge of assessment: Germa <b>n module component o8</b> - Method of grading: num written examinations (1 w	successfully completes), assessment of pra- s, summer semester n, English <b>AS1-1-102:</b> Chemistry erical grade vritten examination: a	ted actical performance, y of the elements Ch pprox. 90 minutes; 2	emistry of the elements written examinations: approx.		
Asses	exams) Assessi Langua <b>sment i</b> 6 ECTS, a) 1 to 3 60 or 9 candida	ate (pre-experiment exam , log (5 to 10 pages) ment offered: once a year ge of assessment: Germa <b>n module component o8</b> - Method of grading: num written examinations (1 w o minutes each; 3 written	successfully complete is), assessment of pra- is, summer semester in, English <b>AS1-1-102:</b> Chemistry erical grade written examination: a in examinations: appro- utes) or c) oral examin	ted actical performance, y of the elements Ch pprox. 90 minutes; 2 px. 60 minutes each	emistry of the elements		
Asses	exams) Assessi Langua <b>sment i</b> 6 ECTS, a) 1 to 3 60 or 9 candida	ate (pre-experiment exam , log (5 to 10 pages) ment offered: once a year ge of assessment: Germa <b>n module component 08</b> - Method of grading: num written examinations (1 w o minutes each; 3 written ate each (approx. 20 minu ge of assessment: Germa	successfully complete is), assessment of pra- is, summer semester in, English <b>AS1-1-102:</b> Chemistry erical grade written examination: a in examinations: appro- utes) or c) oral examin	ted actical performance, y of the elements Ch pprox. 90 minutes; 2 px. 60 minutes each	emistry of the elements written examinations: approx. ) or b) oral examination of one		
Asses	exams) Assessi Langua <b>sment i</b> 6 ECTS, a) 1 to 3 60 or 9 candida Langua	ate (pre-experiment exam , log (5 to 10 pages) ment offered: once a year ge of assessment: Germa <b>n module component 08</b> - Method of grading: num written examinations (1 w o minutes each; 3 written ate each (approx. 20 minu ge of assessment: Germa	successfully complete is), assessment of pra- is, summer semester in, English <b>AS1-1-102:</b> Chemistry erical grade written examination: a in examinations: appro- utes) or c) oral examin	ted actical performance, y of the elements Ch pprox. 90 minutes; 2 px. 60 minutes each	emistry of the elements written examinations: approx. ) or b) oral examination of one		
Asses	exams) Assess Langua <b>sment i</b> 6 ECTS, a) 1 to 3 60 or 9 candida Langua t <b>tion of</b>	ate (pre-experiment exam , log (5 to 10 pages) ment offered: once a year ge of assessment: Germa <b>n module component 08</b> - Method of grading: num written examinations (1 w o minutes each; 3 written ate each (approx. 20 minu ge of assessment: Germa	successfully complete is), assessment of pra- is, summer semester in, English <b>AS1-1-102:</b> Chemistry erical grade written examination: a in examinations: appro- utes) or c) oral examin	ted actical performance, y of the elements Ch pprox. 90 minutes; 2 px. 60 minutes each	emistry of the elements written examinations: approx. ) or b) oral examination of one		

### Workload

## Teaching cycle

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

§ 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"

#### Module appears in

Module	e title				Abbreviation	
Bachel	or Thes	is FOKUS Chemistry			08-BA-FOKUS-112-m01	
Module	e coord	inator		Module offered by		
head o	f the re	search group offering the	e module	Chair of Biochemist	try	
ECTS	1	od of grading		er succ. compl. of module(s)		
10	nume	rical grade	Where applicable, specific modules/module components as specifie			
			supervisor (cf. Section 15 Subsection 2 FSB (subject-specific provis		SB (subject-specific provisions)).	
Duration Module level Other prerequisites						
1 seme	ster	undergraduate				
Conten	Its					
		ives students the opport scientific methods they			problem within a given time frame	
Intend	ed lear	ning outcomes				
		able to conduct research to present the results of t			the principles of good scientific	
	-	, number of weekly conta			n)	
no cou	rses as	signed				
		s <b>essment</b> (type, scope, la on on whether module c			tion offered — if not every seme-	
		(approx. 40 pages) ssessment: German, Eng	lish			
Allocat	ion of p	olaces				
			-			
Additio	onal inf	ormation				
Additio	onal info	ormation on module dura	ation: 8 weeks.			
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regu	lations for teaching-	degree programmes)		
Module	e appea	irs in				
Bachel	or' deg	ree (1 major) FOKUS Chei	mistry (2011)			

Module	title				Abbreviation		
Bioche	mistry				08-BC-092-m01		
Module	coord	inator		Module offered by			
				Chair of Biochemistry			
ECTS	nolder of the Chair of Biochemistry ECTS Method of grading Only after su		Only after succ. com				
6		rical grade	Only after succ. compl. of module(s)				
Duratio			Other prerequisites	Other prerequisites			
	2 semester undergraduate			site to assessment: s	successful completion of exerci-		
			ses in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regu-				
			lar attendance of exercises (usually a maximum of 2 incidents of unexci				
			sed absence).				
Conten	ts						
Compri mistry.	sing le	ctures and exercises, this	s module acquaints s	tudents with the fun	damental principles of bioche-		
Intende	ed learr	ning outcomes					
		e become familiar with th cal processes in cellular s		ples of biochemistry	. They are able to describe the		
Course	<b>s</b> (type,	, number of weekly conta	ct hours, language –	· if other than Germa	ın)		
V + Ü +	V + Ü (	no information on SWS (	weekly contact hours	) and course langua	ge available)		
Method	d of ass		nguage — if other tha	an German, examina	tion offered — if not every seme-		
or 90 m	inutes		tions: approx. 60 min	utes each) or b) oral	tten examinations: approx. 60 l examination of one candidate . 30 minutes)		
Allocat							
Additio	nal info	ormation					
Worklo	ad		·				
Teachi	ng cycl	e					
	-3 -9 -0	-					
Referre	d to in	LPOI (examination regu	lations for teaching.	legree programmes)			
		(examination regu					
Module	e appea	irs in					
	-	ree (1 major) Chemistry (2					
	-	ree (1 major) Chemistry (2	•				
	-	ree (1 major) Nanostructu ree (1 major) Nanostructu					
	-	ree (1 major) Nanostructu ree (1 major) FOKUS Cher		1			
	-	ee (1 major) Chemistry (2					
		,,,	,				

Module coor	gn Studies			Module title Abbreviation					
	FOKUS Foreign Studies 08-FAP-112-mo1								
	dinator		Module offered by						
degree programme coordinator FOKUS Chemie (Chemi		Chemie (Chemistry)	•	v and Pharmacy					
	od of grading		nly after succ. compl. of module(s)						
9 (not)	successfully completed								
Duration	Duration Module level Other prerequisites								
1 semester	undergraduate								
Contents									
change progr course offere the compete	ammes such as Erasmus d in the context of the Bac nt coordinator in advance.	etc. The contents of t chelor's programme i	he course should co	e this course in the context of ex- rrespond to the contents of a lab TS credits); please consult with					
Intended lea	rning outcomes								
	familiar with procedures a d subject-specific skills as			ntries other than Germany. They s.					
Courses (typ	e, number of weekly conta	ct hours, language –	· if other than Germa	in)					
P (no informa	ation on SWS (weekly cont	act hours) and cours	e language available	a)					
	<b>sessment</b> (type, scope, la tion on whether module ca			tion offered — if not every seme-					
	15 minutes) or written rep assessment: German, Eng		pages)						
Allocation of	places								
Additional in	formation								
Additional in	formation on module dura	tion: 8 weeks.							
Workload									
Teaching cyc	le								
Referred to i	n LPO I (examination regu	lations for teaching-o	legree programmes)						
Module appe	ars in								
Bachelor' de	gree (1 major) FOKUS Cher	nistry (2011)							

Modul	e title				Abbreviation	
FOKUS	Indust	rial work experience			08-FIP-112-m01	
Modul	e coord	inator		Module offered by	<u> </u>	
degree programme coordinator FOKUS Chemie (Chemistry)			Chemie (Chemistry)	Faculty of Chemistr	y and Pharmacy	
ECTS	CTS Method of grading Only after succ. compl. of module(s)			· · ·		
9	(not) s	successfully completed		-		
Duratio	Duration Module level Other prerequisites					
1 seme	ster	undergraduate				
Conten	ts					
red in t	he con				e contents of a lab course offe- please consult with the compe-	
Intend	ed lear	ning outcomes				
		amiliar with procedures a ersonal skills.	and processes used i	n industry. They hav	e developed both subject-speci-	
Course	<b>s</b> (type	, number of weekly conta	ct hours, language –	- if other than Germa	n)	
P (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available	2)	
		<b>essment</b> (type, scope, la on on whether module ca			tion offered — if not every seme-	
		.5 minutes) or written rep ssessment: German, Eng		pages)		
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Additic	onal info	ormation on module dura	ition: 8 weeks.			
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regu	lations for teaching-o	legree programmes)		
Module	e appea	urs in				
Bachel	or' deg	ree (1 major) FOKUS Cher	nistry (2011)			

	Module title Abbreviation						
Advan	ced res	earch lab course			08-FOP-112-m01		
Modul	le coord	inator		Module offered by	<u> </u>		
head o	of the re	search group offering the	e module	Faculty of Chemistr	y and Pharmacy		
ECTS	Meth	Method of grading Only after succ. compl. of module(s)			· · ·		
9	(not)	successfully completed	npleted				
Duration Module level Other prerequisites							
1 semester undergraduate							
Conte	nts						
		ives students the opport ne in question.	unity to explore a res	earch topic and app	ly the methods commonly used		
Intend	led lear	ning outcomes					
	nts are a resentat		research topic and p	resent the results of	their work in a written report or		
Course	<b>es</b> (type	, number of weekly conta	act hours, language –	- if other than Germa	n)		
P (no i	informat	tion on SWS (weekly cont	tact hours) and cours	e language available	e)		
		s <b>essment</b> (type, scope, la ion on whether module c			tion offered — if not every seme-		
		5 minutes) or written rep ssessment: German, Eng		pages)			
Alloca	tion of		-				
Allocation of places							
		Diaces					
	onal inf	ormation					
 Additi			ation: 8 weeks.				
 Additi	onal inf	ormation	ation: 8 weeks.				
 <b>Additi</b> Additio	onal inf	ormation	ation: 8 weeks.				
 Additio Additio Worklo	onal info oad	ormation ormation on module dura	ation: 8 weeks.				
 Additio Additio Worklo	onal inf	ormation ormation on module dura	ation: 8 weeks.				
 Additio Additio Worklo  Teachi 	onal inf oad ing cycl	ormation ormation on module dura e		degree programmes)			
 Additio Additio Worklo  Teachi 	onal inf oad ing cycl	ormation ormation on module dura		degree programmes)			
 Additio Worklo  Teachi  Referro 	onal inf oad ing cycl	ormation ormation on module dura e LPOI (examination regu		degree programmes)			

Modul	e title				Abbreviation		
Organi	ic Chem	istry 1			08-0C1-092-m01		
Modul	e coord	inator		Module offered by			
		Professorship of Organi	c Chemistrv	Institute of Organic	Chemistrv		
ECTS		od of grading	Only after succ. cor				
5		rical grade					
Duratio	on	Module level	Other prerequisites	6			
1 seme	ester	undergraduate	Admission prerequisite to assessment: successful completion of exerci-				
			ses in the respective classes as specified at the beginning of the course				
				(usually 70% of exercises to be successfully completed) as well as regu- lar attendance of exercises (usually a maximum of 2 incidents of unexcu-			
			sed absence).	ercises (usually a m	aximum of 2 inciden	ts of unexcu-	
Contor			seu absence).				
Conter						14	
		rovides students with a ituation of carbon and i					
	-	ounds. The module also			•	<i>,</i> ,	
dition	and elir	nination reactions as w	ell as synthesis plann	ing.			
Intend	ed leari	ning outcomes					
		v important categories					
		re to determine simple					
		are able to describe and they can analyse and c					
synthe		they can analyse and e					
Course	es (type	, number of weekly con	tact hours, language –	– if other than Germa	n)		
V + Ü (	no infor	mation on SWS (weekly	/ contact hours) and c	ourse language avail	able)		
Metho	d of ass	essment (type, scope,	language — if other th	an German, examina	tion offered — if not	every seme-	
		on on whether module		-			
		n examinations (1 writt					
	-	written examinations: 6 oral examination in gro			one candidate each	(approx. 20	
	tion of p		<u>, , , , , , , , , , , , , , , , , , , </u>				
Additio	onal inf	ormation					
Worklo	nad						
Teachi	ing cycl	٩					
	ing cyce	•					
Referre	ed to in	LPO I (examination reg		degree programmes)			
		mie "Organische und E					
	e appea	-					
		ree (1 major) Biochemis	try (2011)				
	-	ree (1 major) Biochemis	•				
	-	ree (1 major) Biochemis	• -				
	-	ree (1 major) Chemistry					
	-	ree (1 major) Chemistry					
Bachel	lor' deg	ree (1 major) Mathemat	ics (2012)				
Bachelor's	s with 1 maj	or FOKUS Chemistry (2011)		generated 26-Aug-2024 • ex	-	page 18 / 41	
			ta record Bac	helor (180 ECTS) FOKUS Chen	ne - 2011		

Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) FOKUS Chemistry (2011) First state examination for the teaching degree Gymnasium Chemistry (2009)

Organi	e title				Abbreviation	
	ic Chem	istry 2			08-0C2-102-m01	
Module	e coord	inator		Module offered by		
holder	of the (	Chair of Physically Orga	anic Chemistry	Institute of Organic Chemistry		
ECTS	1	od of grading	Only after succ. cor		,	
9	nume	rical grade	08-0C1			
Duratio	on	Module level	Other prerequisites	5		
1 semester underg		undergraduate	Admission prerequisite to assessment: successful completion of exe ses in the respective classes as specified at the beginning of the cou (usually 70% of exercises to be successfully completed) as well as re lar attendance of exercises (usually a maximum of 2 incidents of une sed absence).			f the course vell as regu-
Conten	nts					
the exa on read well as py, mas	ample o ctions to s rearran ss spec	of carbonyl compounds o complex reaction me ngement. In addition, i strometry and NMR spe	the rules of aromaticity , it extends the studen chanisms. The course a t introduces students to ctroscopy.	ts' knowledge of sub also focuses on oxida	stitution, elimination ation and reduction	n and additi- reactions as
Intende	ed lear	ning outcomes				
unknow to draw <b>Course</b> V + V + <b>Method</b> ster, in a) 1 to go m each (a	wn reac w conclu s (type Ü (no i d of ass formati 3 writte ninutes approx.	tions. Students are ab usions regarding the m , number of weekly cor nformation on SWS (w sessment (type, scope, ion on whether module en examinations (1 writt each; 3 written examin	ntact hours, language – eekly contact hours) ar language — if other th can be chosen to earn ten examination: appro nations: approx. 60 min examination in groups	nt spectroscopic meth – if other than German nd course language a nan German, examinan n a bonus) px. 90 minutes; 2 writh nutes each) or b) ora	nods, to evaluate a s n) vailable) tion offered — if not ten examinations: a examination of one	pectrum and every seme- pprox. 60
0	tion of p	olaces				candidate
Allocat						candidate
						candidate
Allocat	onal inf	ormation				candidate
Allocat	onal inf					candidate
Allocat						candidate
Allocat  Additio						candidate
Allocat  Additio	oad	ormation				candidate
Allocat  Additio  Worklo 	oad	ormation				candidate
Allocat  Additio  Worklo  Teachin 	oad ng cycl	ormation e	gulations for teaching-	degree programmes)		candidate
Allocat  Additio  Worklo  Teachin 	oad ng cycl	ormation e	gulations for teaching-	degree programmes)		candidate
Allocat  Additio  Worklo  Teachin  Referre	ng cycl	ormation e LPOI (examination re	gulations for teaching-	degree programmes)		candidate
Allocat  Additio  Worklo  Teachin  Referre  Module Bachel Bachel Bachel	ng cycl ed to in e appea lor' deg lor' deg lor' deg	ormation e LPOI (examination re	stry (2011) stry (2013) / (2010)	degree programmes)		candidate

Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) FOKUS Chemistry (2011)

Organic Cha			-	Abbreviation	
organic chei	mistry 3			08-0C3-102-m01	
Module coor	dinator		Module offered by	<u> </u>	
holder of the	Professorship of Organic	Chemistry Institute of Organic Chemistry			
ECTS Meth	nod of grading	Only after succ. con	npl. of module(s)		
15 num	erical grade	08-OC1 and 08-AC1	(module component	: 08-AC1-2 only) or 08	8-OC1 and
o8-AN1 (module component o8-AN1-2 only), o8-OC1 may be repla				replaced by	
		08-OC1-GHR			
Duration Module level		Other prerequisites			
1 semester	undergraduate	By way of exception	, additional prerequ	isites are listed in th	e section or
		assessments.			
Contents					
tallic chemis ge they have experiments write lab repo	scusses the fundamenta try and retrosynthesis. Th gained through the relat in the laboratory. In addi orts to demonstrate their ple experimental unit ope	e module gives stude ed lecture(s). After a s tion to those experim knowledge. The cours	nts the opportunity afety briefing, the st ents, students will b se focuses on the sa	to apply in practice t udents autonomous e expected to take of e handling of hazard	he knowled ly conduct ral tests and dous sub-
· · ·	rning outcomes	_			
Courses (typ	ctical experiments in the e, number of weekly cont				
	comprises 2 module com				each module
	comprises 2 module com 3-1-102: V + Ü (no informa 3-2-102: P (no information	ponents. Information ation on SWS (weekly	on courses will be li contact hours) and c	sted separately for e ourse language avai	lable)
• 08-0C	3-1-102: V + Ü (no informa	ponents. Information ation on SWS (weekly n on SWS (weekly con anguage — if other th	on courses will be li contact hours) and c tact hours) and cour an German, examina	sted separately for e ourse language avai se language availabl	lable) le)
• 08-0C Method of as ster, informa Assessment	3-1-102: V + Ü (no informa 3-2-102: P (no information seessment (type, scope, l tion on whether module o in this module comprises stated otherwise, success	ponents. Information ation on SWS (weekly n on SWS (weekly con anguage — if other th can be chosen to earn s the assessments in t	on courses will be li contact hours) and c tact hours) and cour an German, examina a bonus) he individual modul	sted separately for e ourse language avai se language availabl tion offered — if not e components as sp	lable) le) every seme ecified be-
<ul> <li>08-0C3</li> <li>Method of as ster, informa</li> <li>Assessment</li> <li>low. Unless sividual assessividual assestructure assessividual assessividual assessite assessividual</li></ul>	3-1-102: V + Ü (no information 3-2-102: P (no information <b>seessment</b> (type, scope, l tion on whether module of in this module comprises stated otherwise, success sments. <b>in module component o8</b> , Method of grading: num written examinations (1 w to minutes each; 3 writte ate each (approx. 20 min age of assessment: German prerequisites: Admission tive classes as specified a eted) as well as regular a	aponents. Information ation on SWS (weekly n on SWS (weekly con anguage — if other th can be chosen to earn the assessments in t ful completion of the <b>B-OC3-1-102:</b> Organic ( herical grade written examination: a n examinations: appro- uutes) or c) oral exami- an, English prerequisite to asses at the beginning of the	on courses will be li contact hours) and cour tact hours) and cour an German, examina a bonus) he individual modul module will require Chemistry 3 Organic pprox. 90 minutes; 2 ox. 60 minutes each nation in groups (gro ssment: successful o course (usually 70%	sted separately for e ourse language avai se language availabl ition offered — if not e components as sp successful completio Chemistry 3 written examination or b) oral examinat oups of 2, approx. 30 completion of exerci of exercises to be su	lable) le) every seme ecified be- on of all ind us: approx. ion of one minutes) ses in the uccessfully
<ul> <li>08-OC</li> <li>Method of as ster, informa</li> <li>Assessment low. Unless sividual assessividual assessividual assessividual assessividual assessividual assessividual assessividual assessiment</li> <li>6 ECTS</li> <li>a) 1 to 3 60 or 9 candid</li> <li>Langua</li> <li>Other 1 respect completed absent</li> <li>9 ECTS</li> </ul>	3-1-102: V + Ü (no information 3-2-102: P (no information <b>sesssment</b> (type, scope, l tion on whether module of in this module comprises stated otherwise, success sments. <b>in module component o8</b> , Method of grading: num a written examinations (1) to minutes each; 3 writte ate each (approx. 20 min age of assessment: Germ porerequisites: Admission tive classes as specified a eted) as well as regular a tee). <b>in module component o8</b> , Method of grading: (not st-experiment examination	aponents. Information ation on SWS (weekly n on SWS (weekly con anguage — if other th can be chosen to earn the assessments in t sful completion of the <b>G-OC3-1-102:</b> Organic ( merical grade written examination: a n examinations: appro- utes) or c) oral exami- an, English prerequisite to asses at the beginning of the ttendance of exercise <b>G-OC3-2-102:</b> Organic ( ) successfully comple	on courses will be li contact hours) and cour tact hours) and cour an German, examina a bonus) he individual modul module will require Chemistry 3 Organic pprox. 90 minutes; 2 ox. 60 minutes each nation in groups (gro ssment: successful o course (usually 70% s (usually a maximu Chemistry - lab 1 ted	sted separately for e ourse language avai se language availabl tion offered — if not e components as spe successful completio Chemistry 3 written examination ) or b) oral examinat oups of 2, approx. 30 completion of exerci of exercises to be su m of 2 incidents of u	lable) le) every seme ecified be- on of all ind ns: approx. ion of one minutes) ses in the iccessfully inexcused

- Assessment offered: once a year, summer semester
- Language of assessment: German, English

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### 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	
Organ	ic Chem	histry 4			08-0C4-102-m01	
Modu	e coord	inator		Module offered by		
holder	ofthe	Chair of Organic Chemi	stry II	Institute of Organic	Chemistry	
ECTS	1	od of grading	Only after succ. con	npl. of module(s)		
10		rical grade				
Durati		Module level	Other prerequisites			
1 seme	ester	undergraduate		, additional prerequi	isites are listed in th	e section on
			assessments.			
Conte						
ting gr ces, u	oup tec sing cor	ocuses on heterocyclic hniques. Students enh nplicated working and e product analyses.	ance their experimenta	Il skills by working w	ith special hazardou	us substan-
Intend	ed lear	ning outcomes				
able to protein roids. form c	o charac ns. In ac Student	able to name important cterise and categorise of ddition, they are able to ts know how to safely a syntheses, purification ents.	lyes. Students are able describe the structure nd responsibly handle	to describe the struct of the DNA, carbohy special hazardous s	cture and selective s drates, fats, terpene ubstances. They are	synthesis of es and ste- able to per-
Course	<b>es</b> (type	, number of weekly con	tact hours, language –	- if other than Germa	ın)	
compo •	onent. 08-0C4	omprises 2 module con -1-102: V + Ü (no inform -2-102: P (no informatic	ation on SWS (weekly	contact hours) and c	ourse language avai	ilable)
		sessment (type, scope, ion on whether module			tion offered — if not	every seme-
low. U		n this module comprise ated otherwise, succes ments.				
•	<ul> <li>Assessment in module component o8-OC4-1-102: Organic Chemistry 4 Organic Chemistry 4</li> <li>5 ECTS, Method of grading: numerical grade</li> <li>a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)</li> <li>Language of assessment: German or English</li> <li>Only after successful completion of module components: 08-OC1 or 08-OC1-GHR</li> <li>Other prerequisites: Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).</li> </ul>					
Asses	sment i	n module component o	8-0C4-2-102: Organic	Chemistry - advance	d laboratory course f	for students
•	5 ECTS, pre/pos pages) Assessr Languag Only aft 08-OC3		ion talks (Vor-/Nachtes ar, winter semester nan, English on of module compone	state, approx. 15 mins nts: 08-OC3 (module	e component o8-OC3	-
Bachelor':	s with 1 ma	jor FOKUS Chemistry (2011)		generated 26-Aug-2024 • ex helor (180 ECTS) FOKUS Chen		page 24 / 41

#### Additional information

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#### Workload

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# Teaching cycle

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

§ 62 (1) 2. Chemie "Organische und Bioorganische Chemie"

### Module appears in

Bachelor' degree (1 major) Biochemistry (2011) Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) FOKUS Chemistry (2011)

Bachelor's with 1 major FOKUS Chemistry (2011)

	le title				Abbreviation		
Physic	cal Cher	nistry 1			08-PC1-092-m01		
Modul	le coord	inator		Module offered by			
		ture "Grundlagen der Q	uantenmechanik and	-	l and Theoretical Ch	emistry	
		e" (Principles of Quanti					
Spectr	roscopy		r				
ECTS		od of grading	Only after succ. con	npl. of module(s)			
8		rical grade					
Durati		Module level	Other prerequisites			<u> </u>	
1 seme	ester	undergraduate		site to assessment: s			
				e classes as specifie			
				(usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexce			
				ercises (usually a ma	aximum of 2 inciden	is of unexcu-	
			sed absence).				
Conte							
			the fundamental princip				
			article in a box, harmon				
			pectroscopy, angular m e module discusses line				
	•		r transform and orthogo			•	
sted a		· ·				•	
Intend	led lear	ning outcomes					
Stude	nts are a	able to explain key mo	dels of quantum mecha	nics and to apply the	em to molecules. Th	ey are able	
			nethods. In addition, st	udents know how to	apply the mathema	tical bases of	
quant	um mec	hanics.					
			ntact hours, language –				
V + Ü -	+ V + Ü (	no information on SWS	6 (weekly contact hours	) and course languag	ge available)		
			language — if other the can be chosen to earn		tion offered — if not	every seme-	
a) 1 to	3 writte	n examinations (1 writ	ten examination: appro	x. 90 minutes; 2 writ	ten examinations: 6	o or 90 mi-	
			60 minutes each) or b)		one candidate each	(approx. 20	
			oups (groups of 2, appi	rox. 30 minutes)			
Alloca	tion of <sub>l</sub>	olaces					
Additi	onal inf	ormation					
Workl	oad						
_	ing cycl	e					
Teach							
Teach							
	ed to in	LPOI (examination re	gulations for teaching-o	degree programmes)			
	ed to in	LPOI (examination re	gulations for teaching-o	degree programmes)			
 Referr 	_		gulations for teaching-o	degree programmes)			
 Referr  Modul	le appea	irs in		degree programmes)			
 Referr  Modul Bache	<b>le appea</b> lor' deg	n <b>rs in</b> ree (1 major) Biochemi	stry (2011)	degree programmes)			
 Referr  Modul Bache Bache	<b>le appea</b> lor' deg lor' deg	n <b>rs in</b> ree (1 major) Biochemi ree (1 major) Biochemi	stry (2011) stry (2013)	degree programmes)			
 Referr  Bache Bache Bache	<b>le appea</b> lor' deg lor' deg lor' deg	n <b>rs in</b> ree (1 major) Biochemi	stry (2011) stry (2013) stry (2009)	degree programmes)			
 Referr  Bache Bache Bache Bache	le appea lor' deg lor' deg lor' deg lor' deg	r <b>rs in</b> ree (1 major) Biochemi ree (1 major) Biochemi ree (1 major) Biochemi	stry (2011) stry (2013) stry (2009) / (2010)	degree programmes)	am reg da-	page 26 / 41	

Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) FOKUS Chemistry (2011)

Module	e title				Abbreviation
		nistry 2: Thermodynami	cs, Kinetics, Electroch	nemistry	08-PC2-092-m01
Module	e coord	inator		Module offered by	
lectureı mie"	r of lect	ture "Thermodynamik, K	inetik, Elektroche-	Institute of Physica	l and Theoretical Chemistry
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
18	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate	By way of exception assessments.	, additional prerequ	isites are listed in the section on
Conten	ts				
tunity to the stue will be	o apply dents a expect	in practice the knowled	lge they have gained t xperiments in the lab	hrough the related l oratory. In addition t	dule gives students the oppor- ecture(s). After a safety briefing, to those experiments, students owledge.
solution of chem	ns, gas nical re try and	es, mixed phases and e actions. They are able to	lectrochemical reaction connect the theoretic	ons. Students are ab cal principles of the	ribe thermodynamic aspects of le to interpret the kinetic aspects rmodynamics, kinetics, electro- e to analyse the resulting measu-
Course	<b>s</b> (type	, number of weekly cont	act hours, language –	- if other than Germa	an)
compoi • 0	nent. 8-PC2-	2-092: P (no information	n on SWS (weekly con	tact hours) and cour	sted separately for each module se language available) course language available)
		sessment (type, scope, l on on whether module of			ation offered — if not every seme-
	less st	ated otherwise, success			e components as specified be- successful completion of all indi-
<ul> <li>9</li> <li>V</li> <li>A</li> <li>0</li> <li>Assess</li> <li>Kinetics</li> <li>9</li> <li>a)</li> <li>6</li> <li>0</li> <li>re</li> </ul>	ECTS, fortesta estate ( ssessm only aft <b>ment in</b> s, Elect ECTS, ) 1 to 3 o minu approx other p especti	(post-experiment exams nent offered: once a yea er successful completion <b>n module component o8</b> rochemistry Method of grading: num written examinations (1 ites each; 3 written exam . 20 minutes) or c) oral e rerequisites: Admission ve classes as specified a ted) as well as regular a	) successfully completes, approx. 15 minutes , approx. 15 minutes , approx. 15 minutes r, winter semester n of module compone - <b>PC2-1-092:</b> Thermod written examination: ninations: 60 minutes examination in groups prerequisite to assess the beginning of the	ted each), assessment of each) nts: 08-PC1-1 or 08-I ynamics, Kinetics, E approx. 90 minutes each) or b) oral exan (groups of 2, approx ssment: successful of course (usually 70%	lectrochemistry Thermodynamics; ; 2 written examinations: 60 or nination of one candidate each

#### Additional information

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### Workload

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# Teaching cycle

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

§ 62 (1) 1. Chemie "Allgemeine und Anorganische Chemie"; "Physikalische und Analytische Chemie"

#### Module appears in

Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) FOKUS Chemistry (2011)

Module	title			Abbreviation			
Physical	and Theoretical Chemistry	: Symmetry and Quant	tum Chemistry	08-PC3-092-m01			
	coordinator		Module offered by				
	of lecture "Quantenchemie"		Institute of Physical and Theoretical Chemistry				
	Method of grading	Only after succ. com	pl. of module(s)				
6 r	numerical grade						
Duration	Module level	Other prerequisites	Other prerequisites				
1 semest	er undergraduate	Admission prerequis	site to assessment:	successful completion of exe	erci-		
		ses in the respective	ses in the respective classes as specified at the beginning of the course				
		(usually 70% of exer	rcises to be success	fully completed) as well as re	egu-		
		lar attendance of ex	ercises (usually a m	aximum of 2 incidents of une	excu-		
		sed absence).					
Contents	5						
	ule discusses the fundamer	tal principles of quant	um chemistry and s	mmetry in chemistry			
		itat principles of qualit	an chemistry and Sy	minicuy in chemisuy.			
	l learning outcomes						
	s have become familiar with t nd are able to apply the know			emistry and symmetry in che-			
Courses	(type, number of weekly con	tact hours, language —	· if other than Germa	n)			
V + Ü + V	′ + Ü (no information on SWS	(weekly contact hours)	) and course langua	ge available)			
				tion offered — if not every se	me-		
	ormation on whether module				inc		
	written examinations (1 writt			minations: 60 or 00 minutes			
				indidate each (approx. 20 mi	inu-		
-	oral examination in groups						
Allocatio	on of places						
Addition	al information						
Hadicion							
Workloa	d						
Teaching	g cycle						
Referred	to in LPO I (examination reg	ulations for teaching-o	legree programmes)				
		<u>,                                    </u>	<u> </u>				
Madula	annoarc in						
	appears in	+ ()					
	r' degree (1 major) Biochemis						
	r' degree (1 major) Chemistry r' dogree (1 major) Chemistry						
	r' degree (1 major) Chemistry r' degree (1 major) Mathemat	-					
	r' degree (1 major) Mathemat						
	r' degree (1 major) Kathemat r' degree (1 major) Computati		രി				
	r' degree (1 major) Computati		-				
	r' degree (1 major) Computati						
	r' degree (1 major) FOKUS Ch		<i></i>				
	e examination for the teaching	•	Chemistry (2009)				
	e examination for the teaching						
	e examination for the teaching	,					
	th 1 major FOKUS Chemistry (2011)	JMU Würzburg •	generated 26-Aug-2024 • ex		/ 41		
		ta record Bach	nelor (180 ECTS) FOKUS Chen	1IE - 2011			



First state examination for the teaching degree Gymnasium Chemistry (2009) First state examination for the teaching degree Mittelschule Chemistry (2013)

Physic	e title				Abbreviation		
inysit	al Cher	nistry 4: Statistical Th	nermodynamics		08-PC4-092-m01		
Module	a coord	inator		Module offered by			
		ture "Statistische The	rmodynamik"	Institute of Physical and Theoretical Chemistry			
ECTS	1	od of grading	Only after succ. cor	· · · · ·			
3		rical grade					
Duratio		Module level	Other prerequisites				
1 seme		undergraduate	i i i		successful completion of exerci-		
				ses in the respective classes as specified at the beginning of the course			
				•	fully completed) as well as regu-		
			lar attendance of exercises (usually a ma		aximum of 2 incidents of unexcu		
			sed absence).				
Conten	its						
This mo	odule d	liscusses the fundame	ental principles of statis	stical thermodynamic	S.		
Intend	ed lear	ning outcomes					
		e become familiar with wledge they have dev		iples of statistical the	ermodynamics and are able to		
Course	<b>s</b> (type	, number of weekly co	ontact hours, language -	– if other than Germa	ın)		
v + Ü (r	no infoi	rmation on SWS (weel	kly contact hours) and c	ourse language avail	able)		
			e, language — if other th le can be chosen to earr		tion offered — if not every seme-		
or 90 m	ninutes				tten examinations: approx. 60 l examination of one candidate		
each (a	approx.	20 minutes) or c) ora					
each (a			l examination in groups				
Allocat	ion of <sub>l</sub>	olaces					
Allocat	ion of <sub>l</sub>						
Allocat	ion of <sub>l</sub>	olaces					
Allocat	ion of p	olaces					
Allocat  Additio	ion of p	olaces					
Allocat  Additio	ion of ponal inf	olaces ormation					
Allocat  Additio  Worklo 	ion of ponal inf	olaces ormation					
Allocat  Additio  Worklo  Teachin	tion of p pnal inf pad	ormation e		(groups of 2, approx	. 30 minutes)		
Allocat  Additio  Worklo  Teachin	tion of p pnal inf pad	ormation e	l examination in groups	(groups of 2, approx	. 30 minutes)		
Allocat  Additio  Worklo  Teachin 	ng cycl	ormation e LPOI (examination r	l examination in groups	(groups of 2, approx	. 30 minutes)		
Allocat  Additio  Worklo  Teachin  Referre  Module	ng cycl	ormation e LPOI (examination r	l examination in groups	(groups of 2, approx	. 30 minutes)		
Allocat  Additio  Worklo  Teachin  Referre Bachel Bachel Bachel	cion of p pnal inf pad ng cycl ed to in e appea or' deg or' deg	ormation e LPOI (examination r ars in ree (1 major) Chemisti ree (1 major) Chemisti	l examination in groups egulations for teaching- ry (2010) ry (2009)	(groups of 2, approx	. 30 minutes)		
Allocat  Additio  Worklo  Teachin  Referre Bachel Bachel Bachel Bachel	ed to in or' deg or' deg or' deg	e EPOI (examination reference) POI (examina	egulations for teaching- ry (2010) ry (2009) chemistry (2011)	(groups of 2, approx	. 30 minutes)		
Allocat  Additio  Worklo  Teachin  Referre Bachel Bachel Bachel First sta	ed to in eappea or' deg or' deg ate exa	e E E E E E E E E E E E E E	egulations for teaching- ry (2010) ry (2009) hemistry (2011) ning degree Grundschul	(groups of 2, approx degree programmes) e Chemistry (2009)	. 30 minutes)		
Allocat  Additio  Worklo  Teachin  Referre Bachel Bachel Bachel Bachel First sta First sta	ed to in ord deg or' deg or' deg or' deg ate exa ate exa	e E E E E E E E E E E E E E	egulations for teaching- ry (2010) ry (2009) themistry (2011) ning degree Grundschul ning degree Hauptschul	(groups of 2, approx (groups of 2, approx degree programmes) e Chemistry (2009) e Chemistry (2009)	. 30 minutes)		
Allocat  Additio  Worklo  Teachin  Referre Bachel Bachel Bachel Bachel Bachel Bachel First sta First sta	ed to in or' deg or' deg or' deg or' deg ate exa ate exa ate exa	e E E E E E E E E E E E E E	egulations for teaching- ry (2010) ry (2009) hemistry (2011) ning degree Grundschul	(groups of 2, approx degree programmes) e Chemistry (2009) chemistry (2009)	. 30 minutes)		

Module	e title				Abbreviation		
Progra	mming	course for Chemistry Ma	ıjor		08-PKC-102-m01		
Module	e coord	inator		Module offered by			
lecture	r of lec	ture "Programmierkurs fü	Chemiker" Institute of Physical and Theoretical Chemist		l and Theoretical Chemistry		
ECTS		od of grading	Only after succ. con	pl. of module(s)			
5	5 (not) successfully completed						
Duratio	Duration Module level			Other prerequisites			
1 semester undergraduate		ses in the respective (usually 70% of exe	e classes as specifie rcises to be successf	successful completion of exerci- d at the beginning of the course fully completed) as well as regu- aximum of 2 incidents of unexcu-			
Conten	ts						
		provides an introduction t d to problems in chemist		of a programming lar	nguage and discusses how they		
Intende	ed lear	ning outcomes					
Studen chemis		able to describe the fund	amentals of the prog	ramming language a	nd to apply them to problems in		
Course	<b>s</b> (type	, number of weekly conta	ict hours, language –	· if other than Germa	n)		
S + Ü (r	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)		
		<b>sessment</b> (type, scope, la ion on whether module c			tion offered — if not every seme-		
		nination: completion of p ssessment: German, Eng		s and oral descriptio	on of algorithms used		
Allocat	ion of <sub>l</sub>	places					
	_						
Additio	onal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	ed to in	LPOI (examination regu	lations for teaching-o	legree programmes)			
Module	e appea	ars in					
Module appears in Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) FOKUS Chemistry (2011) Bachelor' degree (1 major) Functional Materials (2012)							

Module					Abbreviation	
Theore	tical M	odels in Chemistry			08-TC-092-m01	
Module	a coord	inator		Module offered by		
			1			
	1	ture "Quantenchemie"			l and Theoretical Chemistry	
ECTS	1	od of grading	Only after succ. com	ipl. of module(s)		
3	L	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate			successful completion of exerci-	
					d at the beginning of the course	
			(usually 70% of exe	rcises to be success	fully completed) as well as regu-	
			lar attendance of ex	lar attendance of exercises (usually a maximum of 2 incidents of unexcu		
			sed absence).			
Conten	ts		•			
This mo	odule p	rovides students with	deeper insights into ad	vanced topics in qua	antum chemistry. It focuses on	
					ion energy, configuration interac	
tion an	d excit	ed states, the Born-Op	openheimer approximati	on and bonding mo	dels of H2+.	
Intend	ed lear	ning outcomes				
Studen	its are a	able to describe excite	ed states of molecules w	ith the help of key c	oncepts and models.	
			ntact hours, language –		•	
			kly contact hours) and co			
			e, language — if other tha e can be chosen to earn		ition offered — if not every seme	
					tten examinations: approx. 60	
					l examination of one candidate	
each (a	pprox.	20 minutes) or c) ora	examination in groups	(groups of 2, approx	. 30 minutes)	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	۵				
reaction	is cyce					
Referre	d to in	<b>IPOI</b> (examination r	egulations for teaching-o	legree programmes		
Module	e appea	urs in				
Bachel	or' deg	ree (1 major) Chemisti	ry (2010)			
Bachel	or' deg	ree (1 major) Chemisti	ry (2009)			
Bachel	or' deg	ree (1 major) Mathema	atics (2012)			
Bachel	or' deg	ree (1 major) Mathema	atics (2013)			
Bachel	or' deg	ree (1 major) Computa	itional Mathematics (20	09)		
Bachel	or' deg	ree (1 major) Computa	itional Mathematics (20:	12)		
Bachel	-		tional Mathematics (20	13)		
		ree (1 major) FOKUS C				

Module	e title				Abbreviation
Scienti	fic Disc	cussion			08-WD-FOKUS-112-m01
Module	o coord	inator		Module offered by	
		mme coordinator FOKUS	Chemie (Chemistry)		y and Pharmacy
ECTS	r <u> </u>	od of grading	Only after succ. com	· ·	yanu mamacy
				dule components as specified by	
		supervisor (cf. Secti	on 12 Subsection 4 F	SB (subject-specific provisions)).	
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
This mo fields.	odule g	ives students the opport	unity to deliver prese	ntations on and disc	cuss topics in a range of research
Intende	ed lear	ning outcomes			
		able to present scientific al research problems.	information in a man	ner that is tailored to	o their target group as well as to
Course	<b>s</b> (type	, number of weekly conta	ct hours, language —	if other than Germa	ın)
Ü (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)
		sessment (type, scope, la on on whether module ca			tion offered — if not every seme-
(approx	x. 30 m	ation of one candidate e inutes each) or c) 3 oral e ssessment: German, Eng	examinations of one of		ninations of one candidate each rox. 20 minutes each)
Allocat	ion of <b>j</b>	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPOI (examination regu	lations for teaching-c	legree programmes)	
Module	e appea	urs in			
Bachel	or' deg	ree (1 major) FOKUS Cher	nistry (2011)		

Module	title				Abbreviation		
		for students in Chemis	stry and Biology		10-M-MCB-101-m01	L	
Module	coord	inator		Module offered by	ļ		
		es Mathematik (Mathe	matics)	· · · · · · · · · · · · · · · · · · ·			
		od of grading		succ. compl. of module(s)			
		rical grade					
Duratio		Module level	Other prerequisites				
<b>Duration</b> 1 semester		undergraduate	ning of the course o the specified registr to qualify for admiss certain percentage o the respective detai exercise will be con sessment. If studen assessment over the gistration for assess will be admitted to a	Other prerequisites Registration for the exercise must be made via SB@home at the begin ning of the course or as announced by the lecturer in accordance with the specified registration deadlines. Certain prerequisites must be me to qualify for admission to assessment (e. g. successful completion of certain percentage of exercises). The lecturer will inform students abo the respective details at the beginning of the course. Registration for t exercise will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their gistration for assessment into effect. Students who meet all prerequis will be admitted to assessment in the current or in the subsequent set ster. For assessment at a later date, students will have to obtain the q			
	nal rela ions in	several variables, pov	and integration of funct wer series, ordinary diff				
		ning outcomes					
The stud	dent is	able to recognise and	phrase simple questio to them and interpret th		nces as mathematica	al problems,	
			ntact hours, language –		ın)		
V + Ü (n	o infor	mation on SWS (week	ly contact hours) and co	ourse language avail	able)		
			, language — if other the e can be chosen to earn		ition offered — if not	every seme-	
written	examiı	nation (approx. 90 to 1	20 minutes)				
Allocati	on of p	olaces					
Addition	nal inf	ormation					
Workloa	ad						
Teachin	g cycl	9					
Referred	d to in	LPOI (examination re	gulations for teaching-o	degree programmes)			
Module	appea	in					
	-	ree (1 major) Biochemi ree (1 major) Biochemi	-				
	_	or FOKUS Chemistry (2011)	JMU Würzburg •	generated 26-Aug-2024 • ex helor (180 ECTS) FOKUS Cher		page 36 / 41	

Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) Food Chemistry (2009) Bachelor' degree (1 major) FOKUS Chemistry (2011) No final examination Special study offering (2010)

Module title				Abbreviation	
	to Physics for Students	of Non-physics-related	d Minor Subjects	11-EFNF-072-m01	
Module coord			Module offered by		
	ector of the Institute of A	<u></u>	Faculty of Physics a	and Astronomy	
	od of grading	Only after succ. con	npl. of module(s)		
ļ	erical grade				
Duration	Module level	Other prerequisites			
2 semester	undergraduate				
Contents					
Mechanics, v	ibration theory, thermod	ynamics, optics, scien	nce of electricity, Ato	mic and Nuclear Ph	ysics.
	ning outcomes				-
	have knowledge of the p	principles of Physics			
	e, number of weekly con		if other than Corma		
	rmation on SWS (weekly				
	sessment (type, scope,	0 0		ition offered — if no	t every seme-
	tion on whether module		a bonus)		
written exam	ination (approx. 120 min	utes)			
Allocation of	places				
Only as part o	of pool of general key sk	ills (ASQ): 10 places. P	laces will be allocate	ed by lot.	
Additional in	formation				
Workload					
WUIKIDau					
Teaching cyc	le				
Referred to in	LPOI (examination reg	ulations for teaching-o	degree programmes)		
Module appe	ars in				
	gree (1 major) Biochemis	trv (2011)			
-	gree (1 major) Biochemis	•			
-	gree (1 major) Biochemis				
Bachelor' deg	gree (1 major) Biology (2	011)			
	gree (1 major) Biology (20				
-	gree (1 major) Biology (20				
-	gree (1 major) Chemistry				
-	gree (1 major) Chemistry				
-	gree (1 major) Chemistry				
-	gree (1 major) Chemistry				
-	gree (1 major) Geography				
-	gree (1 major) Geography gree (1 major) Geography				
-	gree (1 major) Geography gree (1 major) Computer				
Bacholor' dor	Siec (1 major) computer				
-	ree (1 maior) Computer				
Bachelor' deg	gree (1 major) Computer	•			
Bachelor' deg Bachelor' deg	gree (1 major) Computer	Science (2010)			
Bachelor' deg Bachelor' deg Bachelor' deg	gree (1 major) Computer gree (1 major) Food Chen	Science (2010) nistry (2009)			
Bachelor' deg Bachelor' deg Bachelor' deg Bachelor' deg	gree (1 major) Computer gree (1 major) Food Chen gree (1 major) Mathemat	Science (2010) histry (2009) ics (2008)			
Bachelor' deg Bachelor' deg Bachelor' deg Bachelor' deg Bachelor' deg	gree (1 major) Computer gree (1 major) Food Chen	Science (2010) histry (2009) ics (2008) ics (2014) JMU Würzburg •	generated 26-Aug-2024 • ex helor (180 ECTS) FOKUS Cher	-	page 38 / 41

Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Biomedicine (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2014) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) FOKUS Chemistry (2011)

Module title				Abbreviation	
Practical Course Physics for Students of Non-physics-re			lated Minor Subjects	11-PFNF-072-m01	
Module coordinator			Module offered by		
Managing Director of the Institute of Ap		Applied Physics	Faculty of Physics and Astronomy		
	hod of grading	<u> </u>	compl. of module(s)		
	) successfully completed		· · · · · · · · · · · · · · · · · · ·		
Duration	Module level	Other prerequisi	tes		
1 semester	undergraduate				
Contents		<b>I</b>			
	vibration theory, thermoo	dynamics, optics, X-	rays, nuclear magnetic	resonance, Atomic a	and Nuclear
Physics.	······································		,,, G	,	
Intended lea	arning outcomes				
The student	s have knowledge of the	principles of Physic	s.		
Courses (typ	e, number of weekly con	tact hours, languag	e — if other than Germa	an)	
	ation on SWS (weekly co				
	ssessment (type, scope,				every seme-
	ation on whether module				
a) oral test (	approx. 15 minutes) durir	ng experiment and b	o) ungraded written exa	mination (approx. 9	o minutes)
Allocation o			· • •		
	of pool of general key sk	ills (ASO): 10 places	s. Places will be allocat	ed by lot.	
Additional i	· ·				
Additionatin					
Warkland					
Workload					
Teaching cy	cle				
Referred to	in LPOI (examination reg	gulations for teaching	ng-degree programmes	)	
Module app	ears in				
	egree (1 major) Biochemis				
	egree (1 major) Biochemis				
	egree (1 major) Biochemis				
	egree (1 major) Biology (2				
	egree (1 major) Biology (2				
	egree (1 major) Biology (2				
	egree (1 major) Chemistry				
	egree (1 major) Chemistry				
	egree (1 major) Chemistry				
	egree (1 major) Chemistry				
	egree (1 major) Geography egree (1 major) Geography				
	egree (1 major) Geography				
	egree (1 major) Geography				
	egree (1 major) Computer				
	egree (1 major) Computer	-			
	gree (1 major) Food Cher				
	egree (1 major) Biomedici				
Dacheloi ue					
	najor FOKUS Chemistry (2011)		urg • generated 26-Aug-2024 • e	kam. reg. da-	page 40 / 41

