

Module Catalogue

for the Subject

Chemistry

as Unterrichtsfach

with the degree "Erste Staatsprüfung für das Lehramt an Mittelschulen"

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

JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record L7|032|-|-|H|2013

Contents

The subject is divided into	3
Abbreviations used, Conventions, Notes, In accordance with	4
Scientific Discipline	
·	5
Compulsory Courses	6
Physical Chemistry (teaching degree for secondary schools)	7 8
Organic Chemistry - laboratory course (teaching degree for secondary schools) Basic Mathematics (teaching degree)	8 10
Exercises in Experimental Presentation	10
Organic Chemistry 1 (teaching degree for secondary schools)	13
Organic Chemistry 2 (teaching degree for secondary schools)	15
Biochemistry (teaching degree for secondary schools)	17
Inorganic Chemistry 1 (teaching degree)	19
Teaching	21
Experiments in Chemical Education	22
Chemistry Education: Educational Theory and Models of Teaching Concepts	24
Concepts of Teaching Chemistry	26
Freier Bereich (general as well as subject-specific electives)	27
Subject-specific Extra Skills	28
Toxicology and legal studies	29
Physical Chemistry 4: Statistical Thermodynamics	31
Physical and Theoretical Chemistry 3: Symmetry and Quantum Chemistry	32
Practical spectroscopy 1 (teaching degree for secondary schools)	34
Practical spectroscopy 2 (teaching degree for secondary schools)	35
Inorganic Chemistry of the Elements (teaching degree for secondary schools)	36
Elemental Organic Chemistry (teaching degree for secondary schools)	37
Preparation of Exams Chemistry Organic Chemistry 4 - advanced course	38
Guidance in Self-reliant Scientific Work	40
Preparation of Exams (Primary and Secondary Public Scholl Teachers)	41 42
Extracurricular Sites	42
Electronic structure and spectroscopy	45
Theoretical Models in Chemistry (teaching degree for secondary schools)	46
Organic Chemistry 3 (teaching degree for secondary schools)	47
Thesis	48
Admission work (Chemistry for Secondary School Teachers)	49
,	77



The subject is divided into

section / sub-section	ECTS credits	starting page
Scientific Discipline	54	5
Compulsory Courses	54	6
Teaching	12	21
Freier Bereich (general as well as subject-specific electives)		27
Subject-specific Extra Skills		28
Thesis	10	48

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 3 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	



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:

LASPO2009

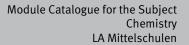
associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

25-Sep-2014 (2014-55)

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

LA Mittelschulen	Chemistry	(2013)	
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Scientific Discipline

(54 ECTS credits)

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 5 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	





Compulsory Courses

(54 ECTS credits)

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 6 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module	e title				Abbreviation
Physical Chemistry (teaching degree for secondary school			for secondary schools	5)	08-PC-GHR-102-m01
Module coordinator				Module offered by	<u>.</u>
für Stu	dierend	ture "Thermodynamik, k le der Biologie, Lebensr emie GHR"		Institute of Physica	l and Theoretical Chemistry
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
4	nume	rical grade			
Duratio	n	Module level	Other prerequisites	i	
1 seme	ster	undergraduate	<i>.</i> ,		
Conten	ts	0			
		iscusses the fundamen		odynamics kinetics	and electrochemistry
		ning outcomes		iodynamics, kineties	and electrochemistry.
Studen	ts have				nics, kinetics and electroche- re and engineering.
Course	S (type, n	number of weekly contact hours	s, language — if other than Gei	rman)	
V + Ü (r	no infor	mation on SWS (weekly	y contact hours) and co	ourse language avail	able)
Metho			uage — if other than German,	examination offered — if no	ot every semester, information on whether
		le for bonus)			
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LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 7 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module	title				Abbreviation	
Organio schools		istry - laboratory cours	e (teaching degree for	secondary	o8-OC-Prakt-GHR-o	92-m01
Module coordinator			Module offered by			
lecturer	rs Orga	nische Chemie (Organi	c Chemistry)	Institute of Organic	Chemistry	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts	Ŭ	1			
lated le dition te their kn operatie	cture(s o those owledg ons of	ives students the oppo b). After a safety briefing e experiments, students ge. The course focuses organic chemistry, simp ning outcomes	g, the students autonor s will be expected to ta on the safe handling o	mously conduct expe ke oral tests and wri f hazardous substan	eriments in the labor te lab reports to den ces, simple experim	atory. In ad- ionstrate
·						
rations	of orga ources.	v how to safely handle nic chemistry. They are They are able to conne ory.	able to analyse the yie	eld and purity of the	products and identif	fy possible
Courses	5 (type, n	umber of weekly contact hours	, language — if other than Ger	man)		
P (no in	format	ion on SWS (weekly co	ntact hours) and course	e language available)	
		e essment (type, scope, lang le for bonus)	uage — if other than German, e	examination offered — if no	t every semester, informati	on on whether
Assessi	ment o	riment examination tal ffered: once a year, sur ssessment: German or	nmer semester	approx. 15 minutes e	ach), log (approx. 5 t	to 10 pages)
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
Teachir	ng cycl	e				
	3 -)	-				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
		mie "Organische und E				
Module						
		mination for the teachi	ng degree Grundschule	Chemistry (2000)		
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First sta (2009)	ate exa	mination for the teachi	ng degree Sonderpäda	gogik Didactics in Ch	emistry (Secondary	School)
First sta		mination for the teachi mination for the teachi			emistry (Middle Sch	100l) (2013)
LA Mittelscł	าulen Che	mistry (2013)		nerated 26-Aug-2024 • exam elschulen (Unterrichtsfach) C		page 8 / 49



LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 9 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	1

Module	e title				Abbreviation
Basic Mathematics (teaching degree)					08-PC-VKM-LA-102-m01
Module coordinator				Module offered by	
lecture	r of blo	ck course "Mathematik"	(Mathematics)	Institute of Physica	l and Theoretical Chemistry
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
2	(not) s	successfully completed		•	
Duratio		Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts		Į		
					sed in physical/theoretical che- thermodynamics and kinetics.
Intende	ed lear	ning outcomes			
Studen	ts have	e been trained in mathem	natical methods. They	, are able to apply th	ose methods to problems in che
mistry.			,		'
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)	
V + Ü (r	no infoi	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	t every semester, information on whether
		ork sheets)			
	-	ssessment: German or E	nglish		
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Additio	nal inf	ormation	-		
Worklo	ad				
Teachi		•	-		
	is cycl				
Referre	d to in	LPO I (examination regulation	s for teaching degree progra	ummec)	
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Module	20002	ors in			
		mination for the teaching	a degree Grundschule	Chemistry (2000)	
					stry (Primary School) (2009)
		mination for the teaching			
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	ate exa	mination for the teaching	g degree Sonderpäda	gogik Didactics in Cł	nemistry (Middle School) (2013)
		mination for the teaching			, , , , , , , , , , , , , , , , , , ,
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Module	e title				Abbreviation	
Exercises in Experimental Presentation				08-Ch-GH-ÜiV-092-	m01	
Module coordinator				Module offered by		
lecture	rs of th	e three lectures offered	in this module	Faculty of Chemistr	y and Pharmacy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
6	(not) s	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts		-1			
		design, prepare and de nonstrations.	liver presentations on	a range of topics in c	hemistry. Presentati	ions will in-
Intend	ed lear	ning outcomes				
the spe particu	ecific ne lar tead	able to deliver a detaile eeds of their audience. ching goal as well as to wledge and skills and t	They are able to select plan and safely perfor	experiments on the	topic in question that	at support a
Course	S (type, r	number of weekly contact hours	s, language — if other than Ge	rman)		
compo • c • c	nent. 08-Ch-L 08-Ch-L	omprises 3 module cor A-ÜiV-1-092: Ü (no info A-ÜiV-2-092: Ü (no info H-ÜiV-3-092: Ü (no info	rmation on SWS (week rmation on SWS (week	ly contact hours) and ly contact hours) and	d course language av d course language av	vailable) vailable)
Metho	d of ass	sessment (type, scope, lang le for bonus)				
low. Ur vidual Assess mistry) 2 t Assess mistry) 2 t t Assess mistry) 2 2 t t Assess mistry) 2 2 t t Assess mistry)	e ECTS, alk with ECTS, alk with Seessr anguag ment in ECTS, alk with Seessr anguag ment in for Prin ECTS, alk with Seessr	n module component of Method of grading: (no n demonstrations (appr nent offered: once a yea ge of assessment: Germ n module component of Method of grading: (no n demonstrations (appr nent offered: once a yea ge of assessment: Germ n module component of mary School and Secon Method of grading: (no n demonstrations (appr nent offered: once a yea	sful completion of the B-Ch-LA-ÜiV-1-092: Exit t) successfully comple ox. 45 minutes) ar, winter semester an or English B-Ch-LA-ÜiV-2-092: Exit t) successfully comple ox. 45 minutes) ar, winter semester an or English B-Ch-GH-ÜiV-3-092: Exit dary Public School Teat t) successfully comple ox. 45 minutes) ar, winter semester	module will require s ercises in Experimen ted ercises in Experimen ted sercises in Experimen chers	successful completion tal Presentation (Ino	on of all indi- organic Che- ganic Che-
		ge of assessment: Germ	ian or English			
Allocat		JIALES				
	nel ! f					
Additio	nat inf	ormation				
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Workload

Teaching cycle

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

§ 42 (1) 3. Chemie "Übungen im Vortragen mit Demonstrationen"

Module appears in

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

First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009)

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

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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 12 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module	e title			_	Abbreviation	
Organi	c Chem	istry 1 (teaching degree	e for secondary schoo	ls)	08-0C1-GHR-092-m01	
Module	e coord	inator		Module offered by		
holder	of the l	Professorship of Organi	c Chemistry	Institute of Organic Chemistry		
ECTS	1	od of grading	Only after succ. con		· · · · ·	
6	1	rical grade				
Duratio		Module level	Other prerequisites			
1 seme		undergraduate	Admission prerequi ses in the respective (usually 70% of exe	site to assessment: e classes as specifie rcises to be success	successful completion of exerci- ed at the beginning of the course fully completed) as well as regu- aximum of 2 incidents of unexcu-	
Conten	ts					
the bor organic	nding s comp	ituation of carbon and i	ntroduces students to discusses the fundan	the nomenclature o nental principles of s	of organic chemistry. It examines f simple and moderately complex stereochemistry, substitution, ad-	
Intende	ed lear	ning outcomes				
lecules that pu synthes	. They a rpose, ses.	are able to describe and	l formulate some of th ategorise the characte	e most important rea ristic reaction condi	nalyse the stereochemistry of mo- actions in organic chemistry. For tions and can use them for simple	
		mation on SWS (weekly				
		sessment (type, scope, langu le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, information on whether	
or 90 m each (a	ninutes approx.		ations: approx. 60 mir examination in groups	nutes each) or b) ora	tten examinations: approx. 60 Il examination of one candidate x. 30 minutes)	
Allocat						
Additio	nal inf	ormation				
	nut ill					
	- d					
Worklo	du					
Teachi	ng cycl	e				
 Def-			.			
		LPOI (examination regulation emie "Organische und B				
Module						
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First sta						
		mistry (2013)		enerated 26-Aug-2024 • exar	n. reg. data re- page 13 /	

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

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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	pag
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module	e title				Abbreviation
Organi	c Chem	istry 2 (teaching degree	for secondary schoo	ls)	08-0C2-GHR-092-m01
Module	e coord	inator		Module offered by	
holder	of the (Chair of Physically Organi	c Chemistry	Institute of Organic	Chemistry
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
7	nume	rical grade			
Duratio		Module level	Other prerequisites		
1 seme	ster	undergraduate	ses in the respective (usually 70% of exe	e classes as specifie rcises to be successi	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				
the exa on read	mple o tions t	f carbonyl compounds, i	t extends the student	s' knowledge of sub	fic reactions of aromatics. Using stitution, elimination and additi- ation and reduction reactions as
Intende	ed lear	ning outcomes			
bonyl c	ompou n plan	nds. They are able to des and formulate multi-stag	scribe specific reaction	ons of carbonyls and	e the varying reactivity of car- aromatics. For that purpose, anisms and can transfer them to
Course	S (type, r	umber of weekly contact hours, l	anguage — if other than Gei	rman)	
V + Ü (r	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)
		s essment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	t every semester, information on whether
or 90 m each (a	ninutes pprox.		tions: approx. 60 mir amination in groups	nutes each) or b) oral	ten examinations: approx. 60 l examination of one candidate . 30 minutes)
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	immes)	
§ 42 (1)	2. Che	mie "Organische und Bic	oorganische Chemie"		
Module		-			
First sta First sta First sta First sta	ate exa ate exa ate exa ate exa	mination for the teaching mination for the teaching mination for the teaching	g degree Grundschule g degree Hauptschule g degree Hauptschule	e Didactics in Chemis e Chemistry (2009) e Didactics in Chemis	stry (Primary School) (2009) stry (Secondary School) (2009)
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LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 15 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

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

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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re- cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	pag
		<u>.</u>

Modul	e title				Abbreviation	
Bioche	emistry	(teaching degree for s	econdary schools)		08-BC-GHR-092-mc	01
Modul	e coord	inator		Module offered by		
holder	of the (Chair of Biochemistry		Chair of Biochemist	iry	
ECTS	Metho	od of grading	Only after succ. con		,	
		rical grade				
4 Duratio		Module level	Other prerequisites			
1 seme	ester	undergraduate	ses in the respective (usually 70% of exe	site to assessment: s e classes as specifie rcises to be success ercises (usually a ma	d at the beginning o fully completed) as v	f the course vell as regu-
Conter	nts					
Compr mistry.	-	ctures and exercises, t	his module acquaints s	tudents with the fun	damental principles	of bioche-
Intend	ed lear	ning outcomes				
		e become familiar with cal processes in cellula	the fundamental princi ar systems.	ples of biochemistry	. They are able to de	scribe the
Course	es (type, r	number of weekly contact hour	rs, language — if other than Ger	rman)		
V + Ü (no infoi	mation on SWS (week	ly contact hours) and co	ourse language avail	able)	
		s essment (type, scope, lang Ile for bonus)	guage — if other than German, o	examination offered — if no	t every semester, informat	on on whether
minute Langua	es) or c) age of a	oral examination in gr ssessment: German or	60 minutes each) or b) oups (groups of 2, appr English		one candidate each	(approx. 20
Allocal	tion of _l	JIACES				
 Additia		ormation				
Additio	onat ini	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulati	ions for teaching-degree progra	immes)		
			Bioorganische Chemie"			
	e appea					
			ing degree Grundschule	Chemistry (2000)		
			ing degree Grundschule		strv (Primarv School)	(2009)
			ing degree Hauptschule		, (,,,)	
			ing degree Hauptschule	• •	stry (Secondary Scho	ol) (2009)
First st	ate exa	mination for the teachi	ing degree Realschule (Chemistry (2009)	-	
(2009)			ing degree Sonderpäda			School)
			ing degree Sonderpäda	gogik Didactics in Cł	nemistry (Middle Scł	
FIRST ST	DTO OVO	mination for the teach		Channel (100l) (2013)
			ing degree Mittelschule	Chemistry (2013)		100l) (2013)
		mistry (2013)	 JMU Würzburg ● ge	chemistry (2013) enerated 26-Aug-2024 • exam elschulen (Unterrichtsfach) C		page 17 / 49



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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 18 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module	title				Abbreviation		
Inorgar	nic Che	mistry 1 (teaching degr	ee)		08-AC1-LA-102-m01	L	
Module	coord	inator		Module offered by	odule offered by		
lecture Chemis		ture "Experimentalchem	iie" (Experimental	Institute of Inorgan	ic Chemistry		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
20	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	undergraduate	By way of exception assessments.	, additional prerequi	isites are listed in th	e section on	
Conten	ts						
les, me module exercise autono ques, th	tals, ac introd es base mously he synt	rovides students with a cid-base reactions, the p uces fundamental mod ed on the lecture on exp conduct experiments in hesis of simple substar advance their laborato	periodic table, chemic els of chemistry and p perimental chemistry a n the laboratory. The c nces and analyses of u	al equilibrium and co rinciples of inorgani nd its extension. Aft ourse focuses on lab	omplexometry. In ad c chemistry. It includ er a safety briefing, t poratory safety, simp	dition, the les practical the students ble lab techni-	
Intende	ed learı	ning outcomes					
le to ex mical fo are able are able loped t	plain b ormula: e to de: e to ide he abil	able to explain the princ asic models of the struc s to describe chemical r scribe the main quantita entify fundamental prob ity to perform the neces anner, both in written a	cture of matter. They h eactions and to interp ative and qualitative a lems in chemistry and sary stoichiometric ca	ave developed the a ret them by identifyi nalytical methods ar perform experiment	bility to use the lang ng the type of reaction nd their application a s to solve them. The	guage of che- on. Students areas. They by have deve-	
Course	S (type, n	number of weekly contact hours	, language — if other than Ge	rman)			
compor • 0 • 0 • 0	nent. 8-AC1- 8-AC1- 8-AC1-	omprises 3 module com 1-102: V + V + Ü (no info LA-2-102: P (no informat LA-3-102: V (no informat :essment (type, scope, langu	rmation on SWS (weel tion on SWS (weekly c tion on SWS (weekly c	kly contact hours) an ontact hours) and co ontact hours) and co	d course language a ourse language avail ourse language avail	available) able) able)	
module is	creditab	le for bonus)					
	less st	n this module comprises ated otherwise, success ments.					
 Assessment in module component o8-AC1-1-102: Principles of Inorganic Chemistry Principles of Inorganic Chemistry 10 ECTS, Method of grading: numerical grade a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German or English Other prerequisites: Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence). Assessment in module component o8-AC1-LA-2-102: Inorganic and Analytical Chemistry (lab) (teaching degree) 7 ECTS, Method of grading: (not) successfully completed 							
LA Mittelsch	nulen Che	mistry (2013)		enerated 26-Aug-2024 • exan elschulen (Unterrichtsfach) C	-	page 19 / 49	

- pre/post-experiment examination talks (Vor-/Nachtestate, approx. 15 minutes each), log (approx. 5 to 10 pages)
- Assessment offered: once a year, summer semester
- Language of assessment: German or English

Assessment in module component o8-AC1-LA-3-102: Inorganic Chemistry 1 (accompanying lecture) (teaching degree)

- 3 ECTS, Method of grading: numerical grade
- a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German or English

Allocation of places

UNIVERSITÄT

WÜRZBURG

Additional information

--

Workload

--

Teaching cycle

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

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

First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009)

First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009)

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

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

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

LA Mittelschulen	Chemistry	(2013)
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Teaching

(12 ECTS credits)

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 21 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module title Abbreviation						
Experin	ments i	n Chemical Education			08-FD-ExUnt-092-m	01
Module	e coord	inator		Module offered by		
holder	of the l	Professorship of Didactic	s of Chemistry	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	i i		
1 seme	ster	undergraduate				
Conten	ts					
This mo their le		quips students with exp	erimental skills and t	eaches them how to	incorporate experim	ents into
Intende	ed lear	ning outcomes				
le scho	ols and	e learned some essential d have developed the ab nts, tailor them to their t	ility to safely perform	them. They have dev	veloped the ability to	
Course	S (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
compo • o	nent. 98-FD-E	omprises 2 module com xUnt-1-092: Ü (no inform xUnt-2-092: S (no inform	ation on SWS (weekly	y contact hours) and	course language ava	ailable)
		Sessment (type, scope, langua le for bonus)	age — if other than German,	examination offered — if no	ot every semester, informati	on on whether
low. Un vidual a Assess dary Pu • 4 • p • L Assess • 1 • p • L	Assessment in this module comprises the assessments in the individual module components as specified be- low. Unless stated otherwise, successful completion of the module will require successful completion of all indi- vidual assessments. Assessment in module component o8-FD-ExUnt-1-o92: Experiments in Chemical Teaching at Primary and Secon- dary Public Schools • 4 ECTS, Method of grading: numerical grade • presentation with demonstration (approx. 30 minutes) • Language of assessment: German or English Assessment in module component o8-FD-ExUnt-2-o92: Planning of Teaching Units • 1 ECTS, Method of grading: numerical grade • presentation (approx. 20 minutes) • Language of assessment: German or English Allocation of places					on of all indi-
 Additio	nalinf	ormation				
Auuitio	indt IIII					
 Worklo	ad					
WORKIO	au					
Toochi						
Teachi	ing cyci	e				
 Poforro	d to in	IPOL (ovamination regulation		ummac)		
§ 36 (1) § 38 (1) § 38 (1)	Referred to in LPO I (examination regulations for teaching-degree programmes) § 36 (1) 7. Didaktik der Grundschule Chemie § 38 (1) 1. Didaktik der Hauptschule Chemie § 38 (1) 1. Didaktik der Mittelschule Chemie § 38 (1) 1. Didaktik der Mittelschule Chemie § 42 Chemie Fachdidaktik					
LA Mittelsc	hulen Che	emistry (2013)		enerated 26-Aug-2024 • exan elschulen (Unterrichtsfach) C	-	page 22 / 49

Module appears in

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

First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009)

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

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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 23 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module title				Abbreviation		
Chemistry Education: Educational Theory and Models of Teaching Concepts					08-FD-Ch-BM-092-m01	
Module coordinator				Module offered by		
holder of the Professorship of Didactic			s of Chemistry	Institute of Inorgan	ic Chemistry	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
4	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
This mo	odule i	ntroduces students to the	e fundamentals of ch	emistry didactics.		
Intende	ed lear	ning outcomes				
		e become familiar with th k conditions of chemistry		r teaching chemistry	as well as with the objectives	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
compo • o	nent. 98-FD-E	inf-1-092: V (no informati	on on SWS (weekly c	ontact hours) and co	sted separately for each module ourse language available) d course language available)	
		Sessment (type, scope, langua Ile for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
low. Un vidual a Assess 3 • w • L Assess minar) • 1 • p • L	• Language of assessment: German or English Assessment in module component o8-FD-Ch-BM-2-092: Introduction in Chemistry Education (accompanying se-					
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 38 (1) § 38 (1) § 42 Ch) 1. Did) 1. Did nemie F	aktik der Grundschule Ch aktik der Hauptschule Ch aktik der Mittelschule Ch Fachdidaktik emie Didaktik	emie			

Module appears in

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 Mittelschule Chemistry (2013)

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 25 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module	Module title Abbreviation				
Concepts of Teaching Chemistry 08-FD-SchulUms-092-mo					08-FD-SchulUms-092-m01
Module	e coord	inator		Module offered by	
holder	ofthe	Professorship of Didactic	s of Chemistry	Institute of Inorgan	ic Chemistry
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
3	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	nts				
Topics	covere	d in the chemistry curricu	ıla for Grundschule a	nd Hauptschule scho	ools and ways to teach them.
Intend	ed lear	ning outcomes			
sons. T	They ha	e become familiar with th ve developed the ability t the basis of the relevant	to plan and teach les		nditions of chemistry les- hule or Hauptschule chemistry
Course	S (type, 1	number of weekly contact hours, l	anguage — if other than Gei	rman)	
S (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	2)
module is	s creditat	sessment (type, scope, langua ble for bonus) approx. 20 minutes)	ge — if other than German,	examination offered — if no	t every semester, information on whether
		issessment: German or Ei	nglish		
Allocat	tion of	places			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
§ 36 (1) 7. Didaktik der Grundschule Chemie § 38 (1) 1. Didaktik der Hauptschule Chemie § 38 (1) 1. Didaktik der Mittelschule Chemie § 42 Chemie Fachdidaktik					
Module appears in					
First st	ate exa	mination for the teaching mination for the teaching mination for the teaching	g degree Hauptschule	Chemistry (2009)	



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

(ECTS credits)

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

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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 27 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	



Subject-specific Extra Skills (ECTS credits)

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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 28 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module title				Abbreviation		
Toxicology and legal studies					03-TR-072-m01	
Module coordinator Module			Module offered by			
lecturer of lecture "Toxikologie und Rechtskunde"			Faculty of Medicine	,		
ECTS Method of grading Only after succ. compl. of module(s)						
3 Duratia		rical grade Module level				
Duratio			Other prerequisites			
1 seme		undergraduate				
Conten						
Basics toxicolo	-	l regulations for chemis	ts (handling and trans	portation of hazardo	ous materials), funda	mentals of
Intende	ed lear	ning outcomes				
		master the basics of leg s the fundamentals of to		nists (handling and t	ransport of hazardo	us substan-
-		umber of weekly contact hours		man)		
		mation on SWS (weekly			able)	
Method	d of ass	eessment (type, scope, langule for bonus)				ion on whether
written	exami	nation (approx. 90 minu	tes)			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad		_			
Workto	au					
 Teeshie		-				
Teachir	ig cycl	e	_			
Referre	d to in	LPO I (examination regulation	ns for teaching-degree progra	mmes)		
Module appears in						
	-	ree (1 major) Biochemis	•			
	-	ree (1 major) Biochemis				
	-	ree (1 major) Biochemis				
	-	ree (1 major) Chemistry				
	0	ree (1 major) Chemistry	. ,			
	-	ree (1 major) Chemistry				
	-	ree (1 major) Chemistry				
	-	ree (1 major) Food Chen				
Bachelor' degree (1 major) FOKUS Chemistry (2011)						
Master's degree (1 major) Chemistry (2013)						
	-	ee (1 major) Chemistry (
	-	ee (1 major) Chemistry (mination for the teachir	•	Chamistry (c)		
		mination for the teachir				
		mination for the teachir mination for the teachir	,			
		mination for the teachir mination for the teachir				
					reg data re-	nage 20 / / 0
L'A MILLEISCI	A Mittelschulen Chemistry (2013) JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re- cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013					puge 29 / 49



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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 30 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module title				Abbreviation			
Physical Chemistry 4: Statistical Thermodynamics			modynamics		08-PC4-092-m01		
Module coordinator				Module offered by			
lecturer of lecture "Statistische Thermodynamik"			odvnamik"	,	l and Theoretical Chemistry		
ECTS	1		Г	· · ·			
		od of grading	Only after succ. con	ipt. of module(s)			
3		rical grade					
Duratio	on	Module level	Other prerequisites				
ses in the respective of the set of the respective of the set of t		ses in the respective (usually 70% of exe	e classes as specifie rcises to be success	successful completion of exerci- d at the beginning of the course fully completed) as well as regu- aximum of 2 incidents of unexcu-			
Conten	nts						
This m	odule c	liscusses the fundament	al principles of statis	tical thermodynamic	S.		
Intend	ed lear	ning outcomes					
		e become familiar with th wledge they have develo		ples of statistical the	ermodynamics and are able to		
Course	S (type, 1	number of weekly contact hours,	anguage — if other than Ger	rman)			
V + Ü (I	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)		
		S essment (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether		
or 90 n	ninutes		tions: approx. 60 mir	nutes each) or b) ora	tten examinations: approx. 60 l examination of one candidate . 30 minutes)		
Allocat							
Additic	onal inf	ormation	-				
Worklo	ad						
TOINU							
Toach	ngevel	0					
Teachi	ing cycl	C					
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)			
 Module	0 2000	Module appears in					
			2010)				
Bachel	or' deg	ree (1 major) Chemistry (
Bachel Bachel	or' deg or' deg	ree (1 major) Chemistry (: ree (1 major) Chemistry (:	2009)				
Bachel Bachel Bachel	or' deg or' deg or' deg	ree (1 major) Chemistry (ree (1 major) Chemistry (ree (1 major) FOKUS Cher	2009) mistry (2011)	e Chemistry (2009)			
Bachel Bachel Bachel First st	or' deg or' deg or' deg ate exa	ree (1 major) Chemistry (: ree (1 major) Chemistry (:	2009) nistry (2011) g degree Grundschule				
Bachel Bachel Bachel First st	or' deg or' deg or' deg ate exa ate exa	ree (1 major) Chemistry (ree (1 major) Chemistry (ree (1 major) FOKUS Cher mination for the teaching	2009) mistry (2011) g degree Grundschule g degree Hauptschule	Chemistry (2009)			
Bachel Bachel Bachel First st First st First st	or' deg or' deg or' deg ate exa ate exa ate exa	ree (1 major) Chemistry (ree (1 major) Chemistry (ree (1 major) FOKUS Cher mination for the teaching mination for the teaching	2009) mistry (2011) g degree Grundschule g degree Hauptschule g degree Realschule (Chemistry (2009) Chemistry (2009)			

Module coordinator Module offered by	-092-m01			
Llacturer at lacture "Ouantanchamia"				
	eoretical Chemistry			
ECTS Method of grading Only after succ. compl. of module(s)				
6 numerical grade				
Duration Module level Other prerequisites				
1 semester undergraduate Admission prerequisite to assessment: successful ses in the respective classes as specified at the be (usually 70% of exercises to be successfully com lar attendance of exercises (usually a maximum of sed absence).	beginning of the course pleted) as well as regu-			
Contents				
This module discusses the fundamental principles of quantum chemistry and symmetry	in chemistry.			
Intended learning outcomes				
Students have become familiar with the fundamental principles of quantum chemistry and	nd symmetry in che-			
mistry and are able to apply the knowledge they have developed.				
Courses (type, number of weekly contact hours, language – if other than German)				
$V + \ddot{U} + V + \ddot{U}$ (no information on SWS (weekly contact hours) and course language availa	ble)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every sem module is creditable for bonus)	nester, information on whether			
a) 1 to 3 written examinations (1 written examination: 90 minutes; 2 written examination: each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate tes) or c) oral examination in groups (groups of 2, approx. 30 minutes)				
Allocation of places				
Additional information				
Workload				
Teaching such				
Teaching cycle				
Referred to in LPO I (examination regulations for teaching-degree programmes)				
Module appears in				
Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Chemistry (2010)				
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)				
First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Hauptschule Chemistry (2009)				
LA Mittelschulen Chemistry (2013) JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013				





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)

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 33 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module title				Abbreviation	
Practical spectroscopy 1 (teaching degree for secondary schools) 08-00					08-0C-Spec-LAGY-092-m01
Modul	Module coordinator Module offered by				
lecture	er of lec	ture "Organische Chemie	2"	Institute of Organic	Chemistry
ECTS	Meth	od of grading	Only after succ. com	pl. of module(s)	
3	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ester	undergraduate			
Conter	nts	~			
	odule i pectros		e spectroscopic meth	ods of infrared spec	troscopy, mass spectrometry and
Intend	ed lear	ning outcomes			
		able to describe importar molecular structure.	it spectroscopic meth	ods, to evaluate a s	pectrum and to draw conclusions
Course	es (type, i	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (no i	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)
Metho	d of as	sessment (type, scope, langua	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
		ole for bonus)			
					tten examinations: approx. 60 l examination of one candidate
		20 minutes) or c) oral ex			
		ssessment: German or Ei			
Allocat	tion of	places			
Additio	onal inf	ormation			
Worklo	bad				
Teachi	ng cycl	e			
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	mmes)	
§ 62 (1	§ 62 (1) 2. Chemie "Organische und Bioorganische Chemie"				
Modul	e appea	ars in			
First st	ate exa	mination for the teaching	g degree Grundschule	Chemistry (2009)	
		mination for the teaching			
		mination for the teaching	-		
		mination for the teaching		, . ,	
First st	ate exa	mination for the teaching	g degree Mittelschule	Chemistry (2013)	

Module	e title			Abbreviation		
Practical spectroscopy 2 (teaching degree for secondary schools)					08-AC2-PS-LA-102-m01	
Module coordinator				Module offered by	<u>.</u>	
lecture	r of lect	ture "Praktische Spektro:	skopie 2"	Institute of Inorgan	ic Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
3	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i		
1 semester undergraduate		undergraduate				
Conten	ts		·			
		quips students with an a ures and properties, spe			d saline compounds. It focuses iical processes.	
Intende	ed lear	ning outcomes				
priate r	nanner		opic methods that ca		saline compounds in an appro- uctural analysis of solids and car	
Course	S (type, r	number of weekly contact hours,	language — if other than Ger	rman)		
V (no ir	nformat	tion on SWS (weekly con	tact hours) and cours	e language available	e)	
		sessment (type, scope, langua le for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether	
or 90 m each (a	ninutes Ipprox.		tions: approx. 60 mir amination in groups	nutes each) or b) ora	tten examinations: approx. 60 l examination of one candidate . 30 minutes)	
Allocat						
Additio	nal inf	ormation	_			
Worklo	ad					
Teachi		e				
	-5 -y -t	•				
Referre	d to in	LPO I (examination regulation		mmec)		
Module	annea	ars in				
		mination for the teaching	g degree Grundschule	Chemistry (2000)		
		mination for the teaching				
		mination for the teaching	,			
		mination for the teaching	,			
	ato ova	mination for the teaching	1			

Module	title				Abbreviation		
Inorganic Chemistry of the Elements (teaching degree for secondary schools)					08-AC2-LAGY-102-m01		
Module	coord	inator		Module offered by			
lecture mistry)	r of lect	ure "Festkörperchemie"	(Solid State Che-	Institute of Inorgani	ic Chemistry		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
3	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semester undergraduate							
Conten	ts						
		quips students with an a ures and properties, spe	_	-	l saline compounds. It focuses ical processes.		
Intende	ed learr	ning outcomes					
		ble to describe the struc . They are able to system			saline compounds in an appro- and reactivity.		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V (no in	Iformat	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, e	examination offered — if no	t every semester, information on whether		
	ge of a	20 minutes) or c) oral ex ssessment: German or Ei Ilaces		(groups of 2, approx.	. 30 minutes)		
Additio	nal info	ormation					
Worklo	ad						
Teachir	ng cycl	9					
		LPO I (examination regulation					
_		mie "Allgemeine und And	organische Chemie";	"Physikalische und /	Analytische Chemie"		
Module							
First sta	First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Grundschule Didactics in Chemistry (Primary School) (2009) First state examination for the teaching degree Hauptschule Chemistry (2009)						
First sta	First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009)						
First sta First sta	ate exa	mination for the teaching	g degree Gymnasium	Chemistry (2009)	nemistry (Secondary School)		
First sta	(2009) First state examination for the teaching degree Sonderpädagogik Didactics in Chemistry (Middle School) (2013) First state examination for the teaching degree Mittelschule Chemistry (2013)						
	First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)						

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 36 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Modul	e title		Abbreviation			
Eleme	ntal Or	ganic Chemistry (teaching	g degree for seconda	ry schools)	08-AC3-LA-102-m01	
Modul	e coord	linator		Module offered by		
	er of lec ic Chem	ture "Elementorganische nistry)	Chemie" (Elemental	Institute of Inorgan	ic Chemistry	
ECTS	Meth	od of grading	Only after succ. com	npl. of module(s)		
4	nume	rical grade	o8-AC1 (module con nent o8-OC3-2 only)		nly) and o8-OC3 (module compo-	
Durati	on	Module level	Other prerequisites			
1 seme	ester	undergraduate	ses in the respective (usually 70% of exe	e classes as specifie rcises to be success	successful completion of exerci- d at the beginning of the course fully completed) as well as regu- aximum of 2 incidents of unexcu-	
Conter	nts					
		equips students with an a pecial material classes, re	_	-	t focuses on their structures and	
Intend	led lear	ning outcomes				
able to explai	o syster n princi	nise them and characteris ples for the synthesis of e	se their structure and elementary organic co	reactivity. In additic	an appropriate manner. They are on, they are able to develop and	
	_	number of weekly contact hours, l				
		rmation on SWS (weekly				
		sessment (type, scope, langua ble for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
or 90 r each (a	minutes approx.		tions: approx. 60 min amination in groups	utes each) or b) ora	tten examinations: approx. 60 l examination of one candidate . 30 minutes)	
Alloca	tion of	places				
Additi	onal inf	ormation				
Workle	oad					
 Taaabi						
Teach	ing cyc	le				
Referr	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
			s to teaching acgree progra			
Modul	e appe	ars in				
First st First st First st First st	tate exa tate exa tate exa tate exa	mination for the teaching mination for the teaching mination for the teaching mination for the teaching	g degree Hauptschule g degree Realschule C g degree Gymnasium	Chemistry (2009) Chemistry (2009) Chemistry (2009)		
rirst st	tate exa	mination for the teaching	g aegree Mittelschule	Cnemistry (2013)		

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 37 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module title Abbreviation							
Prepara	Preparation of Exams Chemistry 08-FBC2-PV-101-m01						
Module	coord	nator		Module offered by			
lecturer mistry)	rs Inorg	anic and Organische C	hemie (Organic Che-	Faculty of Chemistry	y and Pharmacy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
5	(not) s	uccessfully completed	08-OC2-GHR and 08 LAGY	3-OC-Prakt-GHR or o8	-OC2-LAGY and o8-C)C-Prakt-	
Duratio	n	Module level	Other prerequisites				
1 semes	ster	undergraduate					
Conten	ts						
		ives students the oppo the state examination			anic chemistry that a	are likely to	
Intende	ed learr	ing outcomes					
		ble to solve selected q previous years.	uestions on organic ar	nd inorganic chemist	ry that were asked in	ı the state	
Courses	S (type, n	umber of weekly contact hours	s, language — if other than Ge	rman)			
compor • 0	nent. 8-FBC2	omprises 2 module cor -PV-1-101: S (no inform -PV-2-101: S (no inform	ation on SWS (weekly	contact hours) and c	ourse language avail	lable)	
Method	l of ass	essment (type, scope, lang le for bonus)					
Assessi	ment ir less st	this module comprise ated otherwise, succes					
 2 51 A La Assess 3 51 A 	ECTS, uccess ssessn anguag ment ir ECTS, uccess ssessn	module component of Method of grading: (no ful participation in the nent offered: once a yea to of assessment: Germ module component of Method of grading: (no ful participation in the nent offered: once a yea to of assessment: Germ	t) successfully comple form of short presenta ar, summer semester han or English 8-FBC2-PV-2-101: Prep t) successfully comple form of short presenta ar, summer semester	ted tions on selected ass aration of Exams Org ted	signments ganic Chemistry		
Allocati							
Additio	nal info	ormation					
Worklo	ad						
Teachir	ng cycl	9					
Referre	d to in	LPOI (examination regulation	ons for teaching-degree progra	ammes)			
LA Mittelsch	nulen Che	mistry (2013)		enerated 26-Aug-2024 • exam telschulen (Unterrichtsfach) C	-	page 38 / 49	

Module appears in

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)

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 39 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Modul	e title				Abbreviation
Organi	c Chem	histry 4 - advanced cours		08-0C4-LAGY-102-m01	
Modul	e coord	inator		Module offered by	l
holder	ofthe	Chair of Organic Chemist	ry II	Institute of Organic	Chemistry
ECTS		od of grading	Only after succ. com	pl. of module(s)	
5		rical grade	08-0C1 or 08-0C1-G		
<u> </u>		Module level	Other prerequisites		
1 seme	ester	undergraduate	Admission prerequis ses in the respective (usually 70% of exer	site to assessment: e classes as specifie rcises to be success	successful completion of exerc d at the beginning of the cours fully completed) as well as regu aximum of 2 incidents of unexc
Conter	nts				
	zardou				nd syntheses, working with spe ification methods and product
Intend	ed lear	ning outcomes			
able to	charad	terise and categorise dye	es. Students are able	to describe the strue	actions and syntheses. They are cture and selective synthesis of ydrates, fats, terpenes and ster
Course	S (type, r	number of weekly contact hours, I	anguage — if other than Ger	man)	
V + 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, e	examination offered — if no	ot every semester, information on whether
or 90 n each (a	ninutes approx.		tions: approx. 60 min amination in groups	nutes each) or b) ora	tten examinations: approx. 60 l examination of one candidate . 30 minutes)
Allocat	tion of _l	places			
Additio	onal inf	ormation			
 Worklo	ad				
Teachi	ng cycl	e	-		
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	mmes)	
	-	emie "Organische und Bio		/	
	e appea	-	5		
First st First st First st First st	ate exa ate exa ate exa ate exa	mination for the teaching mination for the teaching mination for the teaching mination for the teaching mination for the teaching	g degree Hauptschule g degree Realschule C g degree Gymnasium	e Chemistry (2009) Chemistry (2009) Chemistry (2009)	
	-+	• • • • • • •			

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 40 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Module	e title			Abbreviation	
Guidan	ce in S	elf-reliant Scientific Wor	k		08-FD-WPF-WA-092-m01
Module	e coord	inator		Module offered by	
holder	of the F	Professorship of Didactic	s of Chemistry	Institute of Inorgan	ic Chemistry
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
2	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts		<u>L</u>		
This mo tics.	odule w	vill teach students how to	o independently resea	arch and write on sel	ected topics in chemistry didac
Intende	ed lear	ning outcomes			
Studen	ts are a	able to independently res	search and write on s	elected topics in che	mistry didactics. They are able
provide	e an ac	count of the current state	of research as well a	as to develop ideas to	o advance the discipline.
Course	S (type, r	number of weekly contact hours, I	anguage — if other than Ger	rman)	
S (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)
		Sessment (type, scope, langua ile for bonus)	ge — if other than German, o	examination offered — if no	nt every semester, information on whether
	-	(approx. 30 minutes)			
		ssessment: German or E	nglish		
Allocat	ion of p	olaces			
Additio	nal inf	ormation	-		
Worklo	ad				
Teachi	ng cycl	e			
	<u> </u>				
Referre	d to in	LPOI (examination regulation	s for teaching-degree progra	ummes)	
Module	annea	ars in			
		mination for the teaching	g degree Grundschule	e Chemistry (2009)	
					stry (Primary School) (2009)
First sta	ate exa	mination for the teaching	g degree Hauptschule	e Chemistry (2009)	
					stry (Secondary School) (2009)
	First state examination for the teaching degree Realschule Chemistry (2009) First state examination for the teaching degree Gymnasium Chemistry (2009)				
					nemistry (Secondary School)
(2009)	ale exd	ווווומנוטוו וטו נוופ נפמכוווווזַ	s degree Sonderpada	SUSIN DIUDUIUS III CI	Termstry (Secondary School)
	ate exa	mination for the teaching	g degree Sonderpäda	gogik Didactics in Cł	nemistry (Middle School) (2013)
		mination for the teaching			-
				• • -	try (Middle School) (2013)

Module	e title			Abbreviation					
Prepara	ation o	f Exams (Primary and Sec	condary Public Schol	l Teachers)	08-FD-WPF-PVGSHS-092-m01				
Module	e coord	inator		Module offered by					
holder	of the l	Professorship of Didactic	s of Chemistry	Institute of Inorga	nic Chemistry				
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)					
2	nume	rical grade							
Duratio	on	Module level	Other prerequisites						
1 seme	ster	undergraduate							
Conten	ts		•						
Studen	ts will	solve selected questions	that were asked in th	ne state examinatio	n in previous years.				
		ning outcomes							
	-		estions that were ask	ed in the state exa	mination in previous years.				
		number of weekly contact hours, l							
	-	tion on SWS (weekly cont			ام)				
module is	s creditab	le for bonus)		examination offered — if r	ot every semester, information on whether				
written	exami	nation (approx. 30 minut	es)						
Allocat	ion of _l	olaces							
Additio	onal inf	ormation							
Worklo	ad								
Teachi	ng cycl	e							
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)					
			· · · ·						
Module	e appea	ars in							
		mination for the teaching	g degree Grundschule	Chemistry (2009)					
					istry (Primary School) (2009)				
	First state examination for the teaching degree Hauptschule Chemistry (2009)								
			/		istry (Secondary School) (2009)				
First sta (2009)		mination for the teaching	g degree Sonderpada	gogik Didactics in (Chemistry (Secondary School)				
		mination for the teaching	g degree Sonderpäda	gogik Didactics in (Chemistry (Middle School) (2013)				
			/		,				
-		• • • • • • •			First state examination for the teaching degree Mittelschule Chemistry (2013) First state examination for the teaching degree Mittelschule Didactics in Chemistry (Middle School) (2013)				

Module title					Abbreviation	
Extracı	urricula	r Sites			08-FD-WPF-LLL-092-	m01
Module	e coord	inator		Module offered by		
holder	of the F	Professorship of Didaction	cs of Chemistry	Institute of Inorgani	c Chemistry	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	(not) s	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	Contents					
This m	odule d	iscusses the opportunit	ies and limitations of	out-of-classroom lea	rning in chemistry.	
Intend	ed learı	ning outcomes				
activiti	es in sc	able to plan chemistry le hool labs that support t ney perform experiment	heir teaching goals. T			
Course	S (type, n	umber of weekly contact hours,	language — if other than Ger	rman)		
compo • c						vailable)
		essment (type, scope, langu le for bonus)	age — if other than German,	examination offered — if no	t every semester, informatio	n on whether
low. Ur		n this module comprises ated otherwise, success ments.				
 Assessment in module component o8-FD-WPF-LLL-1-092: Opportunities of Extracurricular Sites 2 ECTS, Method of grading: (not) successfully completed presentation of a project (approx. 30 minutes) Language of assessment: German or English Assessment in module component o8-FD-WPF-LLL-2-092: School Lab 2 ECTS, Method of grading: (not) successfully completed successful supervision of experiments in learn-teach-lab Language of assessment: German or English 						
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	nrs in				
First st	ate exa	mination for the teachin mination for the teachin mination for the teachin	g degree Grundschule	e Didactics in Chemis	try (Primary School) ((2009)
LA Mittelsc	hulen Che	mistry (2013)		enerated 26-Aug-2024 • exam elschulen (Unterrichtsfach) C	-	page 43 / 49
					-	

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

First state examination for the teaching degree Hauptschule Didactics in Chemistry (Secondary School) (2009) First state examination for the teaching degree Realschule Chemistry (2009)

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

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

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

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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 44 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Modul	e title			Abbreviation	
Electro	onic stru	cture and spectroscopy			08-PC-ESS-092-m01
Modul	e coord	inator		Module offered by	l
	ecturer of lecture "Elektronische Struktur and Spektros vie" (Electronic Structure and Spectroscopy)			Institute of Physica	l and Theoretical Chemistry
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
3	nume	rical grade			
Duratio		Module level	Other prerequisites		
1 seme	ester	undergraduate	ses in the respective (usually 70% of exe	e classes as specifie rcises to be success	successful completion of exerci- d at the beginning of the course fully completed) as well as regu- aximum of 2 incidents of unexcu-
Conter	nts				
Fundar	mentals	of atomic and molecula	r structure as well as	spectroscopy.	
Intend	ed lear	ning outcomes			
		e learned the fundamenta nowledge they have deve		ecular structure as v	vell as spectroscopy and are able
Course	es (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
V + Ü (no infoi	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	ot every semester, information on whether
or 90 n each (a	ninutes approx.		tions: approx. 60 mir amination in groups	utes each) or b) ora	tten examinations: approx. 60 l examination of one candidate . 30 minutes)
-	tion of p		0		
Additio	onal inf	ormation			
Worklo	oad				
Teachi	ng cycl	e			
			· · · · · · · · · · · · · · · · · · ·		
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Modul	e appea	urs in			
		mination for the teaching	g degree Grundschule	Chemistry (2009)	
		mination for the teaching			
		mination for the teaching	-		
		mination for the teaching			
First st	ate exa	mination for the teaching	g aegree Mittelschule	Chemistry (2013)	

Module	e title			Abbreviation	
Theore	tical M	odels in Chemistry (teac	ndary schools)	08-TC-LA-092-m01	
Module	Module coordinator Mod			Module offered by	
lecture	r of lect	ture "Quantenchemie"		Institute of Physica	l and Theoretical Chemistry
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
3	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate	ses in the respective (usually 70% of exe	e classes as specifie rcises to be success	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				
spin, th	ne Paul		inants, the Hartree-Fo	ock method, correlat	antum chemistry. It focuses on ion energy, configuration interac- dels of H2+.
Intende	ed lear	ning outcomes			
Studen	its are a	able to describe excited s	tates of molecules w	ith the help of key co	oncepts and models.
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)	
V + Ü (r	no infoi	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, e	examination offered — if no	ot every semester, information on whether
or 90 m	ninutes		tions: approx. 60 min	nutes each) or b) ora	tten examinations: approx. 60 l examination of one candidate . 30 minutes)
Allocat	ion of p	olaces	· · · ·		
Additio	onal 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	urs in			
		mination for the teaching	degree Grundschule	e Chemistry (2009)	
		mination for the teaching	-		
		mination for the teaching	-		
		mination for the teaching			
First sta	ate exa	mination for the teaching	g degree Mittelschule	Chemistry (2013)	

Module	e title		Abbreviation				
Organi	c Chem	istry 3 (teaching degree	ls)	08-0C3-LA-102-m01			
Module	e coord	inator		Module offered by			
holder	of the l	Professorship of Organic	Chemistry	Institute of Organic	Chemistry		
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)			
6		rical grade	08-0C1 or 08-0C1-G				
Duratio		Module level	Other prerequisites				
1 semester		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).				
Conten	Its						
radical	s. It dis				reactions, carbenes, nitriles and symmetric catalysis, organome-		
Intend	ed lear	ning outcomes					
asymm	netric ca				tereoselective syntheses and They are able to conduct retrosyn		
Course	S (type, r	number of weekly contact hours, I	anguage — if other than Ger	man)			
V + Ü (I	no infoi	rmation on SWS (weekly	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	ot every semester, information on whether		
or 90 n each (a	ninutes approx.		tions: approx. 60 mir amination in groups	nutes each) or b) ora	tten examinations: approx. 60 l examination of one candidate . 30 minutes)		
Allocat	_						
	naling	ormation					
Auultio	indt IIII						
Worklo	ad						
Teachi	ng cycl	e					
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)			
			0 = -0.01 P.0310	/			
Module	e appea	ars in					
		mination for the teaching	g degree Grundschule	e Chemistry (2009)			
First state examination for the teaching degree Hauptschule Chemistry (2009)							
First state examination for the teaching degree Realschule Chemistry (2009)							
		mination for the teaching					
First sta	ate exa	mination for the teachinន្	g degree Mittelschule	Chemistry (2013)			





Thesis

(10 ECTS credits)

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

LA Mittelschulen Chemistry (2013)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data re-	page 48 / 49
	cord Lehramt Mittelschulen (Unterrichtsfach) Chemie - 2013	

Modul	e title			Abbreviation			
Admission work (Chemistry for Secondary School Teachers) 08-Ch-HA-UF-HS-092-m01							
Modul	e coord	linator		Module offered by	Module offered by		
head o	of the re	esearch group offering th	ne module	Faculty of Chemistry and Pharmacy			
ECTS	Meth	od of grading	Only after succ. cor	compl. of module(s)			
10	nume	erical grade	Where applicable, specific modules/module components as specified by supervisor.				
Duration		Module level	Other prerequisites				
1 semester		undergraduate					
Conter	nts						
in cher	mistry o		ey have agreed upon	with an authorised e	tly research and write on a topic xaminer in accordance with the rammes).		
Intend	ed lear	ning outcomes					
sions, an app	and off propriat	fer approaches to the so the written account of the	lution of said problem results of their work.) be able to work t	nterpret data, draw logical conclu o deadlines be able to prepare		
	_	number of weekly contact hours	, language — if other than Ge	rman)			
		ssigned					
		sessment (type, scope, langu ble for bonus)	uage — if other than German,	examination offered — if no	ot every semester, information on whether		
Langua	age of a	o (Zulassungsarbeit, app assessment: German, ex ree programmes)		e with Section 29 LF	PO I (examination regulations for		
Alloca	tion of	places					
Additio	onal inf	formation					
Worklo	oad						
	-						
Teachi	ng cyc	le					
Referre	ed to in	LPOI (examination regulation	ns for teaching-degree progra	ammes)			
Modul	e appe	ars in					
		amination for the teaching					
First st	ate exa	amination for the teaching	ng degree Mittelschule	e Chemistry (2013)			