

Module Catalogue

for the Subject

Functional Materials

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

Examination regulations version: 2012 Responsible: Faculty of Chemistry and Pharmacy

JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record 82|g81|-|-|H|2012

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The subject is divided into

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Content and Objectives of the Programme

The Bachelor of Science program Functional Materials at the faculty of Chemistry and Pharmacy prepares students for research and development occupations of both a scientific and a practical nature in the field of materials and natural sciences. Students learn the basic methodical principles of scientific work. The study program's interdisciplinary focus enables students to obtain extensive fundamental knowledge of the fields of chemistry, physics and mathematics. In addition, they acquire expert knowledge of the following engineering and natural sciences subjects: electronics, engineering mechanics, materials science, molecular materials, and compound materials. Close cooperation with the Fraunhofer Institute for Silicate Research ISC, Würzburg-Schweinfurt University of Applied Sciences, the Bavarian Center for Applied Energy Research and the SKZ plastics center guarantees an interdisciplinary education. Thanks to this, students are introduced to multifaceted topics relating to modern functional materials. By means of their bachelor's thesis, students show that they have the ability to act largely independently to solve a specific, time-limited experimental or theoretical assignment of engineering or natural sciences tasks. The results of the bachelor's thesis are presented and defended in a colloquium. The Bachelor of Science degree qualifies students for an occupation of both a scientific and a practical nature in the field of materials and natural sciences in general and of functional materials in particular. However, this generally requires a further qualification to be acquired either through practical experience in industry or through a consecutive master's degree.

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)):

11-Dec-2012 (2012-186)

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



Compulsory Courses

(123 ECTS credits)

Mathewatics 1 and 2 for students of Functional Materials 10-M-FUN12-122-m01 Module coordinator Module offered by Dean of Studies Mathematik (Mathewatics) Institute of Mathematics ECTS Method of grading Only after succ. combule(s) 18 numerical grade	Abbreviation	Module title				
Dean of Studies Mathematik (Mathematics) Institute of Mathematics ECTS Method of grading Only after succ. compl. of module(s) 18 numerical grade	10-M-FUN12-122-m01	Mathematics 1 and 2 for students of Functional Materials				
ECTS Method of grading Only after succ. compl. of module(s) 18 numerical grade	dule offered by	Module coordinator Module				
18 numerical grade	titute of Mathematics	atics)	Dean of Studies Mathematik (Mathematics)			
	of module(s)	nod of grading	Metho	ECTS		
			erical grade	nume	18	
Duration Module level Other prerequisites		Module level	on	Duratio		
2 semester undergraduate By way of exception, additional prerequisites are listed in the se assessments.	By way of exception, additional prerequisites are listed in the section on assessments.					

Contents

Basics on numbers and functions, sequences and series, elementary functions, differential and integral calculus in one variable, vector calculus, linear maps and systems of linear equations, matrix calculus, eigenvalue theory, differential and integral calculus in several variables, differential equations, Fourier analysis, integral theorems.

Intended learning outcomes

The student gets acquainted with important concepts and methods of mathematics. He/She learns to apply these methods to problems in natural and engineering sciences, in particular in the technology of functional materials, and is able to interpret the results.

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

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

- 10-M-FUN12-1-122: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-FUN12-2-122: V + Ü (no information on SWS (weekly contact hours) and course language available)

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

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

Assessment in module component 10-M-FUN12-1-122: Mathematics 1 for students of Functional Materials Mathematics 1 for students of Functional Materials

- 10 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 to 120 minutes, usually chosen) or oral examination of one candidate each (approx. 20 minutes) or oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course 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 registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-FUN12-2-122: Mathematics 2 for students of Functional Materials Mathematics 2 for students of Functional Materials

- 8 ECTS, Method of grading: numerical grade
- written examination (approx. 90 to 120 minutes, usually chosen) or oral examination of one candidate each (approx. 20 minutes) or oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course 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

Bachelor's with 1 major Functional Materials (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. da-	page 8 / 75
	ta record Bachelor (180 ECTS) Funktionswerkstoffe - 2012	

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put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Allocation of places

Additional information

Workload

--

Teaching cycle

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

--

Module appears in

Module	e title				Abbreviation	
Mathen	natics	3 for students of Phy	vsics and Engineering		11-MPI3-062-m01	
Module	e coord	inator		Module offered by		
	ing Dire	ector of the Institute of	of Theoretical Physics	Faculty of Physics and Astronomy		
ECTS		od of grading	Only after succ. cor	npl. of module(s)		
8		rical grade				
- 1		Module level	Other prerequisites	2		
1 semester undergraduate Admission pression to assessive details at the be considered students have over the course assessment in mitted to assessive the course assessive to asse		Admission prerequi 50% of exercises. C sion to assessment ve details at the be be considered a de students have obta over the course of t assessment into eff mitted to assessme	isite to assessment: certain prerequisites to The lecturer will info ginning of the course claration of will to se ined the qualification he semester, the lect fect. Students who m ent in the current or in cer date, students wil	successful completion o must be met to qualify fo orm students about the r c. Registration for the cou ek admission to assess n for admission to assess urer will put their registr eet all prerequisites will the subsequent semes l have to obtain the qual	or admis- respecti- urse will nent. If sment ration for be ad- ter. For	
Conten	ts			sessment anew.		
		partial differential eq	uations in Physics.			
		ning outcomes				
			tical knowledge of dynar	nic equations and so	lution methods for comr	non and
		ntial equations.				
Courses	S (type, r	number of weekly contact ho	ours, language — if other than Ge	rman)		
V + Ü (r	no info	rmation on SWS (wee	ekly contact hours) and c	ourse language avail	able)	
Method	d of ass	sessment (type, scope, la	anguage — if other than German,	examination offered — if no	t every semester, information or	n whether
		ole for bonus)				
written	exami	nation (approx. 120 n	ninutes)			
Allocati	ion of _l	places				
Additio	nal inf	ormation				
Worklo	ad					
Teachir		e				
	-3 -9 -1	-				
Referre	d to in	LPO I (examination regul	ations for teaching-degree progr	ammes)		
				unine <i>3)</i>		
Module	annes	ars in				
		ree (1 major) Physics	(2007)			
	-	ree (1 major) Physics				
	-	ree (1 major) Physics				
	-		logy of Functional Materi	als (2009)		
	-	-	logy of Functional Materi	-		
Bachelo	or' deg	ree (1 major) Nanostr	ructure Technology (2010))		
Bachelo	or' deg	ree (1 major) Nanostr	ructure Technology (2012	2)		
Dachen						

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Bachelor' degree (1 major) Nanostructure Technology (2008) Bachelor' degree (1 major) Nanostructure Technology (2007) Bachelor' degree (1 major) Functional Materials (2012) Bachelor' degree (1 major) Technology of Functional Materials (2006)

Module	e title				Abbreviation
Introdu	iction t	o Physics Part 1 for stude	11-ENNF1-062-m01		
				Module offered by	
Managing Director of the Institute of Applied Physics				Faculty of Physics a	and Astronomy
ECTS Method of grading Only after succ. compl. of module(s)					
7 numerical grade					
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts	-			
		bration theory, thermody	namics.		
		ning outcomes			
		nave basic knowledge of	nhysics for engineeri	ng students	
		umber of weekly contact hours, l			
		•			abla)
		mation on SWS (weekly o			
module is	creditab	le for bonus)		examination offered — if no	ot every semester, information on whether
		nation (approx. 120 minu	tes)		
Allocat					
	· · · · · · · · · · · · · · · · · · ·	f pool of general key skill	s (ASQ): 20 places. P	laces will be allocat	ed by lot.
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	9			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
		× •			
Module	e appea	rs in			
		ree (1 major) Mathematic	s (2008)		
	-	ree (1 major) Mathematic			
Bachel	or' deg	ree (1 major) Mathematic	s (2012)		
Bachel	or' deg	ree (1 major) Mathematic	s (2013)		
Bachel	or' deg	ree (1 major) Mathematic	s (2007)		
Bachel	or' deg	ree (1 major) Technology	of Functional Materia	als (2009)	
	-	ree (1 major) Technology			
	-	ree (1 major) Computatio		•	
	-	ree (1 major) Computatio			
	-	ree (1 major) Computatio			
	-	ree (1 major) Computatio		-	
		ree (1 major) Aerospace (
	-	ree (1 major) Aerospace (•	
	-	ree (1 major) Aerospace (•	011)	
		ree (1 major) Functional N			
васпе	ur aeg	ree (1 major) Technology	oi Functional Materia	115 (2006)	

Module	title		Abbreviation			
Introduction to Physics Part 2 for students of Physics Related Minor Subjects 11-ENNF2-062-mo1						
Module coordinator Module off					<u> </u>	
Managing Director of the Institute of Applied Physics				Faculty of Physics a	and Astronomy	
ECTS	Method of grading		Only after succ. com			
7 numerical grade						
Duration			Other prerequisites			
1 semes						
Content						
	of electricity, magnetism	. optic	s. Atomic Physics.			
	d learning outcomes	, oper				
	lents have basic knowled	dra of	nhysics for onginoori	ng students		
		-		-		
	(type, number of weekly contact				- + -)	
	o information on SWS (we					
		, langua	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
	creditable for bonus)		t			
	examination (approx. 120	minu	tes)			
	on of places		(1.2.2)			
	part of pool of general ke	ey skill	s (ASQ): 20 places. P	laces will be allocat	ed by lot.	
Addition	nal information					
Workloa	ıd					
Teaching	g cycle					
Referred	to in LPO I (examination reg	gulations	s for teaching-degree progra	mmes)		
Module	appears in					
	r' degree (1 major) Mathe	ematic	s (2008)			
Bachelo	r' degree (1 major) Mathe	ematic	s (2014)			
	r' degree (1 major) Mathe					
	r' degree (1 major) Mathe					
	r' degree (1 major) Mathe					
	r' degree (1 major) Techn					
	r' degree (1 major) Techn					
	r' degree (1 major) Comp					
	r' degree (1 major) Comp					
	r' degree (1 major) Comp					
	r' degree (1 major) Comp			-		
	r' degree (1 major) Aeros					
	r' degree (1 major) Aeros	•	•	•		
	r' degree (1 major) Aeros		•)11)		
	r' degree (1 major) Functi r' degree (1 major) Techn			als(2006)		
Dacheio	i degree (1 major) rechn	ology		115 (2000)		

Module	title			Abbreviation	
Physics	s Labor	atory Course for student	s of Physics Related	Minor Subjects	11-PNNF-062-m01
Module	coord	inator		Module offered by	<u> </u>
Managing Director of the Institute of Applied Physics				Faculty of Physics a	and Astronomy
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	· · · · · ·
3 (not) successfully completed					
Duratio		Module level	Other prerequisites		
1 seme		undergraduate			
		undergraduate			
Conten					
Mechar Physics		bration theory, thermody	namics, optics, X-ray	s, nuclear magnetic	resonance, Atomic and Nuclear
Intende	ed lear	ning outcomes			
The stu	dents l	know the principles of Ph	ysics.		
		umber of weekly contact hours, l	·	man)	
		ion on SWS (weekly cont			2)
		*			
		le for bonus)	ge — If other than German, e	examination offered — if no	ot every semester, information on whether
		,	experiment and b) u	ngraded written exa	mination (approx. 90 minutes)
Allocat		• • • •		ingituded written exa	
		f pool of general key skill	s (ASQ): 15 places. P	laces will be allocate	
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ıg cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	irs in			
		ree (1 major) Mathematic	s (2008)		
	-	ree (1 major) Mathematic			
	-	ree (1 major) Mathematic			
	-	ree (1 major) Mathematic			
	-	ree (1 major) Mathematic			
	-	ree (1 major) Technology		als (2000)	
	-	ree (1 major) Technology		-	
	-	ree (1 major) Computatio			
	-	ree (1 major) Computatio		•	
		ree (1 major) Computatio			
	-	ree (1 major) Computatio			
		ree (1 major) Computatio		+)/	
		ree (1 major) Functional N		als(2006)	
Dacilel	or ueg	iee (1 major) recimology		113 (2000)	

Module title		Abbreviation				
Experimenta students	l Chemistry, General and a	Lab for engineering	08-IAC-122-m01			
Module coor	dinator		Module offered by			
lecturer of lecture "Experimentalchemie" (Experimental Chemistry)			Institute of Inorgani	ic Chemistry		
ECTS Meth	od of grading	Only after succ. con	npl. of module(s)			
10 num	erical grade					
Duration	Module level	Other prerequisites				
1 semester	undergraduate					
Contents						
les, metals, a module intro exercises bas autonomous ques, the syr	ncid-base reactions, the pe duces fundamental mode sed on the lecture on expe ly conduct experiments in	eriodic table, chemic ls of chemistry and p erimental chemistry a the laboratory. The c ces and analyses of u	al equilibrium and co rinciples of inorganic nd its extension. Afte ourse focuses on lab	of chemistry. It focuses on partic- complexometry. In addition, the c chemistry. It includes practical er a safety briefing, the students poratory safety, simple lab techni- . In addition, students have the		
Intended lea	rning outcomes					
le to explain mical formul are able to de are able to id loped the ab	basic models of the struct as to describe chemical re escribe the main quantitat entify fundamental proble	ure of matter. They h actions and to interp tive and qualitative a ems in chemistry and ary stoichiometric ca	ave developed the a ret them by identifyin nalytical methods ar perform experiment	formation from it. They are ab- bility to use the language of che- ng the type of reaction. Students ad their application areas. They s to solve them. They have deve- ibe the chemical processes in an		
Courses (type,	number of weekly contact hours, l	anguage — if other than Gei	rman)			
component. • o8-IAC	comprises 2 module comp -1-062: V (no information of -2-122: P (no information of	on SWS (weekly cont	act hours) and cours			
Method of as module is credita		ge — if other than German,	examination offered — if no	t every semester, information on whether		
	tated otherwise, successf			e components as specified be- successful completion of all indi-		
 Assessment in module component o8-IAC-1-o62: Experimental Chemistry 5 ECTS, Method of grading: numerical grade written examination (approx. 90 minutes) Assessment in module component o8-IAC-2-122: General and analytical Chemistry Lab for engineering students 5 ECTS, Method of grading: (not) successfully completed Vortestate (pre-experiment exams, approx. 15 minutes), assessment of practical performance (log approx. 5 to 10 pages), Nachtestate (post-experiment exams, approx. 15 minutes) Assessment offered: once a year, summer semester Language of assessment: German or English Only after successful completion of module component o8-IAC-2. 						
Allocation of	places					

Additional information

Workload

Teaching cycle

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

Module appears in

Organ	le title				Abbreviation	
-	ic Cher	nistry for engineering stu	Idents		08-IOC-122-m01	
Modul	le coor	dinator		Module offered by		
		ıpervisor "Organisch-cher de der Ingenieurwissensc		Institute of Organic Chemistry		
ECTS Method of grading Only after succ. compl. of module(s)						
12	nume	nerical grade				
Durati	on	Module level	Other prerequisites			
1 seme	ester	undergraduate	By way of exception assessments.	n, additional prerequ	isites are listed in th	e section or
Contents						
		provides students with ar le fundamental technique			organic chemistry. In	n addition, i
Intend	led lea	rning outcomes				
		e become familiar with th			nistry. They are able	to identify
		problems in chemistry an				
		number of weekly contact hours, comprises 3 module com				
moaule	is credita	ble for bonus)			ot every semester, informat	
Assess low. U	sment i nless s	in this module comprises tated otherwise, successister		the individual modul	le components as sp	ecified be-
Assess low. Ui vidual Assess mistry	sment i nless s assess sment 2 for e 5 ECTS a) 1 to <u>3</u> 60 or 9 candid Langua Only af	in this module comprises stated otherwise, success sments. in module component o8 ngineering students Method of grading: nume written examinations (1 w o minutes each; 3 writter ate each (approx. 20 minutes ge of assessment: Germa ter successful completior	ful completion of the -IOC-2-122: Organic (erical grade written examination: a n examinations: appr utes) or c) oral exami an or English n of module compone	the individual modul module will require Chemistry 2 for engir approx. 90 minutes; 2 ox. 60 minutes each nation in groups (gro ents: Successful con	le components as sp successful completion neering students Org written examination b) or b) oral examination oups of 2, approx. 30 npletion of module c	ecified be- on of all ind anic Che- ns: approx. tion of one o minutes)
Assess low. Ui vidual Assess mistry 4 6 6 6 6 6 6 6 6 6 6 7 6 7 6 7 7 7 7 7	sment i nless s assess sment 2 for e 5 ECTS a) 1 to 3 60 or 9 candid Langua Only af 08-OC1 Other p respect comple absence	in this module comprises stated otherwise, success sments. in module component o8 ngineering students Method of grading: nume written examinations (1 w o minutes each; 3 writter ate each (approx. 20 minutes ge of assessment: Germa ter successful completion ter successful completion to rerequisites: Admission tive classes as specified a seted) as well as regular at	ful completion of the -IOC-2-122: Organic (erical grade written examination: a n examinations: appr utes) or c) oral exami an or English n of module component rticipation in module prerequisite to assess t the beginning of the tendance of exercise	the individual modul module will require Chemistry 2 for engir approx. 90 minutes; 2 ox. 60 minutes each nation in groups (gro ents: Successful con component o8-IOC- ssment: successful course (usually 70% es (usually a maximu	le components as sp successful completion neering students Org written examination b) or b) oral examination oups of 2, approx. 30 npletion of module c 2. completion of exercises of exercises to be su im of 2 incidents of u	ecified be- on of all ind anic Che- ns: approx. tion of one o minutes) component ises in the uccessfully unexcused
Assession Unividual Vidual Vidual Massession (Constraint)	sment i nless s assess sment 2 for e 5 ECTS a) 1 to 3 60 or 9 candid Langua Only af 08-OC1 Other p respect comple absent 2 ECTS Vortest 5 to 10 Assess Langua Only af 08-OC1 sment	in this module comprises stated otherwise, success sments. in module component o8 ngineering students Method of grading: nume written examinations (1 w o minutes each; 3 writter ate each (approx. 20 minutes each (approx. 20 minutes of assessment: Germa ter successful completion 1-1 is a prerequisite for par prerequisites: Admission tive classes as specified a eted) as well as regular at ter).	ful completion of the -IOC-2-122: Organic (erical grade written examination: an n examinations: apprutes) or c) oral exami- an or English n of module component rticipation in module prerequisite to assess the beginning of the tendance of exercise -IOC-3-122: Organic (successfully comple- us, approx. 15 minutess t-experiment exams, r, winter semester an or English n of module component rticipation in module -OC1-1-092: Organic (the individual modul module will require Chemistry 2 for engir approx. 90 minutes; 2 ox. 60 minutes each nation in groups (gro ents: Successful con component 08-IOC- ssment: successful course (usually 70% to (usually a maximu Chemistry for engine eted s), assessment of pra approx. 15 minutes) ents: Successful con component 08-IOC-	le components as sp successful completion neering students Org written examination) or b) oral examination oups of 2, approx. 30 npletion of module of 2. completion of exercises of exercises to be su of 2 incidents of the ering students (praction ctical performance (line) npletion of module of 3.	ecified be- on of all ind anic Che- ns: approx. tion of one o minutes) component ises in the uccessfully unexcused tical course) og approx.

- 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)
- 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).

Allocation of places

Additional information

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Workload

Teaching cycle

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

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

Module appears in

Module title				Abbreviation	
Physical Che	mistry 1 for engineering	students		08-IPC-122-m01	
Module coor	dinator		Module offered by		
lab course supervisor "Physikalische Chemie für Studierer de der Ingenieurwissenschaften, Praktikum"			Institute of Physical	l and Theoretical Chemistry	
ECTS Method of grading Only after succ. compl. of module(s)					
18 num	erical grade				
Duration	Module level	Other prerequisites			
1 semester	undergraduate				
Contents		•			
	provides students with an ne fundamental technique			physical chemistry. In addition, i	
Intended lea	rning outcomes				
	ve become familiar with th problems in chemistry ar			nistry. They are able to identify	
Courses (type,	number of weekly contact hours,	language — if other than Ger	man)		
• 08-IPC		on SWS (weekly conta	act hours) and course		
	stated otherwise, success			e components as specified be- successful completion of all indi-	
troscopy) for gineering stu • 8 ECTS • written Assessment engineering s • 5 ECTS • written Assessment • 5 ECTS • Vortest	engineering students Phy dents , Method of grading: num examination (approx. 90 in module component o8 students Physical Chemis , Method of grading: num examination (approx. 90 in module component o8 , Method of grading: (not) tate (pre-experiment exam	vsical Chemistry 2 (ba erical grade minutes) -IPC-1-091: Physical C try 1 (thermodynamics erical grade minutes) -IPC-3-122: Physical C successfully complet is, approx. 15 minutes)	sics of quantum med hemistry 1 (thermody s, electrochemistry) f chemistry for enginee ted), assessment of prac	ering students, laboratory course	
 5 ECTS, Method of grading: (not) successfully completed Vortestate (pre-experiment exams, approx. 15 minutes), assessment of practical performance (log approx. 5 to 10 pages), Nachtestate (post-experiment exams, approx. 15 minutes) Assessment offered: once a year, summer semester Language of assessment: German or English Only after successful completion of module components: Successful completion of the two module components o8-IPC-1 and o8-IPC-2 is a prerequisite for participation in module component o8-IPC-3. 					
 Langua Only af ponent 	ment offered: once a yea age of assessment: Germa ter successful completion is o8-IPC-1 and o8-IPC-2 i	r, summer semester an or English a of module componer	nts: Successful comp		
LanguaOnly af	ment offered: once a yea age of assessment: Germa ter successful completion is o8-IPC-1 and o8-IPC-2 i	r, summer semester an or English a of module componer	nts: Successful comp		

Additional information

Workload

Teaching cycle

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

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Module appears in

Module title Abbreviation					
Basics	of Elec	tronics 1			99-EL1-122-m01
Module	coord	inator		Module offered by	<u> </u>
Dean of the Faculty of Electrical Engineering at the Univer ty of Applied Sciences Würzburg-Schweinfurt				University of Applie furt (FHWS)	d Sciences Würzburg- Schwein-
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Conten	ts				
Theoret tors.	ical an	d practical principles of s	science of electricity,	passive linear netwo	orks, principles of semiconduc-
Intende	ed lear	ning outcomes			
		have basic knowledge of semiconductors.	theoretical and pract	ical science of elect	ricity, especially of passive linear
Courses	5 (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)	
V + Ü (n	io 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	t every semester, information on whether
or 90 m each (a	inutes pprox.		tions: approx. 60 mir amination in groups	nutes each) or b) ora (groups of 2, approx	ten examinations: approx. 60 l examination of one candidate . 30 minutes)
Allocati	-				
Additio	nal inf	ormation			
Worklo	ad				
Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	urs in			
Bachelo	or' deg	ree (1 major) Functional N	Materials (2012)		

Module title Abbreviation					
Basics	of Elec	tronics 2			99-EL2-122-m01
Module coordinator				Module offered by	<u> </u>
Dean of the Faculty of Electrical Engineering at the Universi- ty of Applied Sciences Würzburg-Schweinfurt				University of Applie furt (FHWS)	d Sciences Würzburg- Schwein-
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Conten	ts				
		d practical principles of t logy, combinatorial circu			basic circuits, basic elements of
Intende	d lear	ning outcomes			
		have theoretical and prac ements of digital technol			ectrical engineering, basic cir- al circuits.
Courses	5 (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)	
V + Ü (n	io infoi	rmation 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	t every semester, information on whether
or 90 m each (a	inutes pprox.		tions: approx. 60 mir amination in groups	nutes each) or b) ora (groups of 2, approx	ten examinations: approx. 60 l examination of one candidate . 30 minutes)
Allocati	-				
Additio	nal inf	ormation			
Worklo	ad				
Teaching cycle					
Referre	d to in	LPOI (examination regulation	s for teaching-degree progra	mmes)	
Module	appea	ars in			
Bachelo	or' deg	ree (1 major) Functional N	Aaterials (2012)		

Bachelor's with 1 major Functional Materials (2012)

	Module title Abbreviation					
Molecular Materials (Lecture and practical course) 08-CT-122-m01						
Module coordinator				Module offered by	•	
Dean of Studies Funktionswerkstoffe (Functional Materia			Functional Materials)	Chair of Chemical 1	Technology of Material Synthesis	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate	By way of exception assessments.	, additional prerequ	isites are listed in the section o	
Conten	ts		-			
This mo	odule c	liscusses the theoretical	and practical princip	les of molecular and	l soft materials.	
Intend	ed lear	ning outcomes				
		e developed a knowledge ge to research problems.	e of the principles of r	nolecular and soft n	naterials and are able to apply	
Course	S (type, 1	number of weekly contact hours, I	anguage — if other than Ger	rman)		
• c Netho	08-CT-2	-122: P (no information o	n SWS (weekly conta	ct hours) and course	urse language available) e language available) ot every semester, information on whethe	
 low. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments. Assessment in module component o8-CT-1-122: Molecular Materials (Lecture) Molecular Materials (Lecture) 5 ECTS, Method of grading: numerical grade presentation (approx. 30 minutes) and 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 or 90 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). Should a module component comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise specified; should the lecturer want to make changes to the way in which assessments are weighted, he or she must do so by two weeks after the start of the course at the latest and must communicate this to students in an appropriate manner. 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-CT-2-122: Molecular Materials (Practical course) 5 ECTS, Method of grading: (not) successfully completed Vortestate (pre-experiment exams, approx. 15 minutes each) and logs (approx. 5 pages each) Assessment in module component exams, approx. 15 minutes each) and logs (approx. 5 pages each) 						
 5 p n n a a C r c a a C a a a b a a	ment i ECTS, present ninutes roups ssessr vant to anguag Other p espect omple bsence ment i ECTS, (ortesta ssessr anguag	n module component o8- Method of grading: nume ation (approx. 30 minute s; 2 written examinations seach) or b) oral examinat (groups of 2, approx. 30 m nent, all assessments wi make changes to the way e start of the course at the ge of assessment: Germa rerequisites: Admission ive classes as specified at ted) as well as regular at e). n module component o8- Method of grading: (not) ate (pre-experiment examinent offered: once a year ge of assessment: Germa	•CT-1-122: Molecular l erical grade s) and a) 1 to 3 writte s: approx. 60 or 90 r tion of one candidate minutes). Should a m Il be equally weighte in which assessmen latest and must comr n or English prerequisite to asses the beginning of the tendance of exercises •CT-2-122: Molecular successfully complete s, approx. 15 minutes winter semester n or English	Materials (Lecture) A n examinations (1 w ninutes each; 3 writ each (approx. 20 mi odule component co d, unless otherwise ts are weighted, he c nunicate this to stud soment: successful course (usually 70% s (usually a maximu Materials (Practical ted s each) and logs (ap	Molecular Materials (Lecture) rritten examination: approx. 90 tten examinations: approx. 60 nutes) or c) oral examination in omprise more than one graded specified; should the lecturer or she must do so by two weeks lents in an appropriate manner. completion of exercises in the of exercises to be successfully im of 2 incidents of unexcused course) prox. 5 pages each)	
 5 p n n a 4 5 V A C S 	ment i ECTS, present ninutes roups ssessr vant to anguag Other p espect omple bsence ment i ECTS, (ortesta ssessr anguag	n module component o8- Method of grading: nume ation (approx. 30 minute 5; 2 written examinations 6; 2 written examinations 7; 2 written examination	•CT-1-122: Molecular l erical grade s) and a) 1 to 3 writte s: approx. 60 or 90 r tion of one candidate minutes). Should a m Il be equally weighte in which assessmen latest and must comr n or English prerequisite to asses the beginning of the tendance of exercises •CT-2-122: Molecular successfully complete s, approx. 15 minutes winter semester n or English	Materials (Lecture) A n examinations (1 w ninutes each; 3 writ each (approx. 20 mi odule component co d, unless otherwise ts are weighted, he c nunicate this to stud soment: successful course (usually 70% s (usually a maximu Materials (Practical ted s each) and logs (ap	Molecular Materials (Lecture) rritten examination: approx. 90 tten examinations: approx. 60 nutes) or c) oral examination in omprise more than one graded e specified; should the lecturer or she must do so by two weeks lents in an appropriate manner. completion of exercises in the of exercises to be successfully im of 2 incidents of unexcused course)	

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o8-CT-2-122: Students from the Faculty of Chemistry: no restrictions. Nanostrukturtechnik (Nanostructure Technology): 4. Should there be more than 4 applications from students of Nanostrukturtechnik (Nanostructure Technology), places will be allocated among these applicants as follows: (1) Places will be allocated by lot. (2) Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. (3) A waiting list will be maintained and places re-allocated as they become available.

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

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

Module title Abbreviation					
Introdu	iction t	o Functional Materials			11-TMS-102-m01
Module coordinator				Module offered by	
Managing Director of the Institute of Applied Physics			oplied Physics	Faculty of Physics a	and Astronomy
ECTS	TS Method of grading Only after succ. compl. of module(s)				
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semester undergraduate		Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for			
Conten	ts		admission to assess	inent arew.	
Theore	tical an	d practical principles of and oxides. Principles c			ductor process technology, diel- ting procedures.
		ning outcomes			
nology	for ma	terial synthesis.	·		ical material properties and tech
		number of weekly contact hours, l			
		mation on SWS (weekly			
		sessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether
Assess and wi	ment o ll be an		ten assessment will l		on the method of assessment 3 ASPO (general academic and
	ion of p		-		
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
-	- /				
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Bachel	or' deg	ree (1 major) Nanostructu			
Bachelor' degree (1 major) Nanostructure Technology (2012) Bachelor' degree (1 major) Functional Materials (2012)					

Module title Abbreviation						
Princip	les of (Cell Biology and Tissue F	Regeneration		03-FU-Zell-122-m01	
Module	e coord	inator		Module offered by		
holder	ofthe	Chair of Orthopaedics (Ja	kob/Ebert)	Faculty of Medicine		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	Its	~	-			
		of cell biology (cell struct polism, stem cells, viruse			biosynthesis, signal transducti-	
Intend	ed lear	ning outcomes				
Studen	ıts acqı	uire deep knowledge abo	out cell and molecular	biology.		
Course	S (type, r	number of weekly contact hours,	language — if other than Gei	rman)		
V (no ir	nforma	tion on SWS (weekly con	tact hours) and cours	e language available	e)	
		s essment (type, scope, langua	age — if other than German,	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 (groups of 2, approx	tten examinations: approx. 60 l examination of one candidate . 30 minutes)	
Allocat	ion of _l	places				
Additio	onal inf	ormation				
Worklo	ad					
Teaching cycle						
Referre	ed to in	LPOI (examination regulation	is for teaching-degree progra	mmes)		
Module	e appea	ars in				
Bachel	or' deg	ree (1 major) Functional	Materials (2012)			

Bachelor's with 1 major Functional Materials (2012)

Module	title		Abbreviation				
Biomat	erials			03-FU-BM-122-m01			
Module	coord	inator		Module offered by			
holder o Dentist		Chair of Functional Materi	als in Medicine and	Faculty of Medicine			
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
7	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	undergraduate					
Conten	ts						
dificatio proache	on and es in bi	characterisation. Fabrica	tion as well as exam ding hydrogels, addit	ples for application v	s and polymers with surface mo- will be addressed. Modern ap- 3D cell scaffolds and materials for		
Intende	ed leari	ning outcomes					
		e developed a deep know l fabrication.	ledge in the field of b	biomaterials, their us	se in clinics as well as methods		
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
compor • o	nent. 3-FU-B	M-1-122: V (no informatio	n on SWS (weekly co	ntact hours) and cou	sted separately for each module urse language available) l course language available)		
			ge — if other than German, e	examination offered — if no	t every semester, information on whether		
		le for bonus)					
	less st	ated otherwise, successf			e components as specified be- successful completion of all indi-		
 Assessment in module component og-FU-BM-1-122: Biomaterials (Lecture) 5 ECTS, Method of grading: numerical grade a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner Assessment in module component og-FU-BM-2-122: Biomaterials (Practical course and seminar) Biomaterials (Practical course and seminar) 2 ECTS, Method of grading: (not) successfully completed Vortestate (pre-experiment exams, approx. 15 minutes each) and logs (approx. 5 pages each) Assessment offered: once a year, summer semester Language of assessment: German, English if agreed upon with the examiner 							
Allocation of places							
Additio	Additional information						
Worklo	ad						
	_						
Teachir	ng cycl	9					

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

Module appears in

Module title Abbreviation						
Advan	ced lab	oratory course of Functio	onal Materials		08-FU-VP-122-m01	
Modul	e coord	linator		Module offered by		
head o	of the re	esearch group offering the	e module	Chair of Chemical T	echnology of Material Synthesis	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
3	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	undergraduate			es/module components as speci- ction 4 FSB (subject-specific pro-	
Conter	nts					
		gives students the opport ne in question.	unity to explore a res	earch topic and app	ly the methods commonly used	
Intend	ed lear	ning outcomes				
	nts are esenta		research topic and p	resent the results of	their work in a written report or	
Course	es (type, i	number of weekly contact hours,	language — if other than Ge	rman)		
P (no ii	nforma	tion on SWS (weekly con	tact hours) and cours	e language available	2)	
		s essment (type, scope, langua ble for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether	
		15 minutes) Issessment: German, Eng	glish if agreed upon w	vith the examiner		
Allocat	tion of	places				
Additio	onal inf	ormation				
Worklo	bad					
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Modul						
Bachel	lor' deg	ree (1 major) Functional I	Materials (2012)			



Compulsory Electives

(25 ECTS credits)



Compulsory Electives Mechanical and Electrical Engineering

(17 ECTS credits)

Module	Module title Abbreviation						
Basics	of App	lied Mechanics			99-TM-122-m01		
Module	e coord	inator		Module offered by			
		aculty of Mechanical Engi lied Sciences Würzburg-S		University of Applie furt (FHWS)	ed Sciences Würzburg- Schwein-		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites	i			
1 seme	ster	undergraduate					
Conten	ts						
Basics	of stat	istics, strength of materia	ls and dynamics.				
Intend	ed lear	ning outcomes					
		have methodological com ormations and in dimens		ining forces and stre	ss resultants, in calculating ten-		
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ge	rman)			
V + Ü (I	no info	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	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 (groups of 2, approx	tten examinations: approx. 60 l examination of one candidate . 30 minutes)		
Allocat							
Additio	onal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	e appea	ars in					
Bachel	or' deg	ree (1 major) Functional N	Materials (2012)				

Module title Abbreviation						
Labora	tory Co	urse of mechanical and	electrical Engineering	g	99-IP-122-m01	
Module coordinator				Module offered by		
Deans of the Faculties of Electrical Engineering and Me- chanical Engineering at the University of Applied Sciences Würzburg-Schweinfurt			-	University of Appli furt (FHWS)	ed Sciences Würzburg- Schwein-	
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)		
6	(not) s	successfully completed				
Duratio	on	Module level	Other prerequisites	i		
1 seme	ster	undergraduate	Admission prerequi 80%) of courses.	site to assessment:	regular attendance (minimum	
Conten	Its					
Engine	ering la	boratory and internship	experiments.			
Intend	ed lear	ning outcomes				
The stu ring.	ıdents l	have practical experience	es in applying engine	ering methods in el	ectrical and mechanical enginee-	
Course	S (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
P (no ir	nformat	ion on SWS (weekly cont	tact hours) and cours	e language availabl	e)	
		sessment (type, scope, langua le for bonus)	age — if other than German,	examination offered — if n	ot every semester, information on whether	
port on Assess	i techni ment o	oort / fieldwork report / re cal course (approx. 15 to ffered: once a year, sum ssessment: German, Eng	30 pages) mer semester		ctical course / project report / re-	
Allocat						
Additio	onal inf	ormation				
Worklo	ad					
Teaching cycle						
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	ammes)		
Module	e appea	urs in				
Bachel	or' deg	ree (1 major) Functional I	Materials (2012)			

Module title Abbreviation					
Constru	uction,	Calculation and Assemb	ly of Technical Produ	icts	99-CA-122-m01
Module	e coord	inator		Module offered by	
		aculty of Mechanical Engi lied Sciences Würzburg-S	•	University of Applie furt (FHWS)	ed Sciences Würzburg- Schwein-
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
6	nume	rical grade			
Duratio	n	Module level	Other prerequisites	i i	
1 seme	ster	undergraduate			
Conten	ts				
		ve view of the process of ted example.	product developmen	t, including the corre	esponding specialist subjects ba-
Intende	ed lear	ning outcomes			
					opment of products with a focus typing and product validation.
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ge	rman)	
V + K (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether
or 90 m each (a	ninutes ipprox.		ions: approx. 60 mir amination in groups	nutes each) or b) ora (groups of 2, approx	tten examinations: approx. 60 l examination of one candidate . 30 minutes)
Allocat	_				
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	ars in			
		ree (1 major) Functional N	Aaterials (2012)		



Compulsory Electives Physics

(11 ECTS credits)

Module	Module title Abbreviation						
Introdu	iction t	o Nanoscience			11-EIN-092-m01		
Module coordinator				Module offered by			
Managing Director of the Institute of Applied Physics			oplied Physics	Faculty of Physics a	and Astronomy		
ECTS	Metho	od of grading	Only after succ. con				
6	1	rical grade					
Duratio		Module level	Other prerequisites				
2 semester undergraduate		Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew.					
Conten	ts						
		o the principles of produc	cing, characterising a	nd applying nanostr	ructures.		
Intende	ed lear	ning outcomes					
		have knowledge of the fu ructures.	ndamental propertie	s, technologies, cha	racterising methods and functi-		
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Gei	man)			
V + S (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
written otherw			tes, for modules with	less than 4 ECTS cr	edits approx. 90 minutes; unless		
Allocat	ion of p	olaces					
		f pool of general key skill	s (ASQ): 15 places. P	laces will be allocate	ed by lot.		
		ormation	- •				
Worklo	ad						
Teachi	ng cycl	е					
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)			
Module appears in							
Bachel	or' deg	ree (1 major) Nanostructu	re Technology (2010)			
Bachelor' degree (1 major) Nanostructure Technology (2012)							
	-	ree (1 major) Functional N					
		gree (1 major, 1 minor) Ph					
No fina	l exam	ination Special study offe	ering (2010)				

Module title					Abbreviation	
Practical Course Physical Technology of Material Synthes				is	11-PPT-092-m01	
Module coordinator			Module offered by			
Managi	ing Dire	ector of the Institute of A	oplied Physics	Faculty of Physics a	ind Astronomy	
ECTS	Metho	od of grading	Only after succ. co	mpl. of module(s)		
5	(not) s	successfully completed				
Duratio	on	Module level	Other prerequisite	S		
1 semester undergraduate (Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification fo admission to assessment anew.				
Conten	ts					
	al mate	rial properties, growth ar	nd coating procedur	es, methods of charad	cterisation and struc	turing tech-
Intende	ed learr	ning outcomes				
The stu terial sy		nave knowledge of the pi s.	ractical basics of ma	aterial characterisatio	n and physical techr	ology for ma
Course	S (type, n	umber of weekly contact hours,	anguage — if other than G	erman)		
P (no in	nformat	ion on SWS (weekly cont	act hours) and cour	se language available	2)	
		s essment (type, scope, langua le for bonus)	ge — if other than German	, examination offered — if no	ot every semester, informat	ion on whether
tes) pri comple of the a have be comple	or to th eted if a assessn een suc eted.	experiment will be consi e experiment is passed. Testat (exam) is passed nent can be repeated on ccessfully completed in t ffered: once a year, winte	Performing and eva . An experiment log ce in the respective he same semester v	luating the experimer (approx. 8 pages) is t semester. Only if both	it will be considered to be prepared. Each the components of the	successfully component assessment
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
			-			
Teachi	ng cycl	e				
Referre	d to in	LPOI (examination regulation	s for teaching-degree prog	rammes)		
Module	e appea	irs in				
		ree (1 major) Nanostructu ree (1 major) Nanostructu				
Bachelor's	achelor's with 1 major Functional Materials (2012) JMU Würzburg • generated 26-Aug-2024 • exam. reg. da- ta record Bachelor (180 ECTS) Funktionswerkstoffe - 2012 page 37 / 75					





Compulsory Electives Mathematics and Computer Science

(62 ECTS credits)

Module	Module title Abbreviation					
Compu	tationa	l Mathematics			10-M-COM-122-mo1	L
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
4	1	successfully completed				
Duratio	<u> </u>	Module level	Other prerequisites			
1 semesterUndergraduateCertain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective of at the beginning of the course. Registration for the course will be sidered a declaration of will to seek admission to assessment. If a dents have obtained the qualification for admission to assessment the course of the semester, the lecturer will put their registration is sessment into effect. Students who meet all prerequisites will be ted to assessment in the current or in the subsequent semester. If sessment at a later date, students will have to obtain the qualification for admission to assessment admission to assessment anew.			tive details Il be con- nt. If stu- ssment over ition for as- ill be admit- ster. For as-			
Conten	tc					
Introdu merica 10-M-A	iction to l compi NL) and	o modern mathematical s utation (e. g. Matlab) to s ł 10-M-LNA). Computer-b and integral calculus; vi	upplement the basic ased solution of prob	modules in analysis lems in linear algeb	and linear algebra (((10-M-ANA o
Intend	ed lear	ning outcomes				
		arns the use of advanced cation to solve mathema		cal software package	es, and is able to ass	sess their
Course	S (type, r	umber of weekly contact hours, l	anguage — if other than Ger	man)		
1) Ü + V	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, informati	on on whether
beginn	ing of t	form of programming exe he course) ssessment: German, Eng			e specified by the le	cturer at the
Allocat			<u> </u>			
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
	- <u>3</u> -j -t	-				
Referre	d to in	LPOI (examination regulation	s for teaching-degree progra	mmes)		
Module	appea	urs in				
		ree (1 major) Nanostructu	re Technology (2012)	1		
	-	ree (1 major) Economathe				
	-	ree (1 major) Mathematic				
Bachel	Bachelor' degree (1 major) Functional Materials (2012)					
Bachelor's	Achelor's with 1 major Functional Materials (2012) JMU Würzburg • generated 26-Aug-2024 • exam. reg. da- ta record Bachelor (180 ECTS) Funktionswerkstoffe - 2012 page 40 / 75					



First state examination for the teaching degree Gymnasium Mathematics (2012)

Module title					Abbreviation
Ordina	ry Diffe	erential Equations for oth	er Subjects		10-M-DGA-122-m01
Module coordinator				Module offered by	
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	natics
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
10	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 semester undergraduate		Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew.			
Conten	ts				
ferentia Intendo	al equa ed lear	tions; matrix exponentia ning outcomes	l series; linear differe	ntial equations of h	
		s acquainted with the fun /she is able to apply the			heory of ordinary differential
Course	S (type, r	number of weekly contact hours,	anguage — if other than Ger	rman)	
1) Ü + V	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
if anno each (a Langua	unced approx. age of a	20 minutes) or an oral ex ssessment: German, Eng	en examination can be xamination in groups	(groups of 2, approx	l examination of one candidate x. 30 minutes)
Allocat	ion of j	places			
 A J 10-0					
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	ars in			
		ree (1 major) Functional I			

Module	e title				Abbreviation	
Introdu	uction t	o Functional Analysis fo	or other Subjects		10-M-FAA-122-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathen	natics)	Institute of Mathem	natics	
ECTS	Methe	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semesterundergraduateCertain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective at the beginning of the course. Registration for the course will be sidered a declaration of will to seek admission to assessment. If dents have obtained the qualification for admission to assessment the course of the semester, the lecturer will put their registration sessment into effect. Students who meet all prerequisites will be ted to assessment at a later date, students will have to obtain the qualific admission to assessment anew.			ents about the respective details tion for the course will be con- nission to assessment. If stu- or admission to assessment over will put their registration for as- et all prerequisites will be admit- ne subsequent semester. For as-			
Conten	ts	<u> </u>				
		s and Hilbert spaces, b	ounded operators, prin	nciples of functional	analysis.	
	•	ning outcomes	<u> </u>	- p		
broad a	applica S (type, r	ble to apply methods fro bility of the theory to ot number of weekly contact hours rmation on SWS (weekly	her branches of mathe , language — if other than Ger	matics.	al analysis, and realises the	
		sessment (type, scope, langu le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, information on whether	
if anno each (a	unced approx.	nation (approx. 90 to 18 by the lecturer, the writt 20 minutes) or an oral ssessment: German, En	en examination can b examination in groups	(groups of 2, approx	l examination of one candidate x. 30 minutes)	
Allocat			<u> </u>			
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulation	ns for teaching-degree progra	immes)		
Module	e appea	ars in				
Bachel	or' deg	ree (1 major) Functional	Materials (2012)			

	lathematics 1 for Economa		Module title Abbreviation				
Madula		thematics		10-M-NUW-122-m01			
Module coor	rdinator		Module offered by	<u> </u>			
	dies Mathematik (Mathema	atics)	Institute of Mathem	atics			
	hod of grading	Only after succ. com					
	ierical grade	Only after succ. con					
		Other prorequisites					
Duration Module level 1 semester undergraduate		Other prerequisites Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew.					
Contents							
	systems of linear equations lation with polynomials, sp			uations and systems of equati- rical integration.			
Intended lea	arning outcomes						
	is acquainted with the fun problems and knows about			erical mathematics, applies them			
Courses (type	, number of weekly contact hours, l	anguage — if other than Ger	man)				
V + Ü (no inf	ormation on SWS (weekly o	contact hours) and co	ourse language avail	able)			
Method of as module is credita		ge — if other than German, e	examination offered — if no	ot every semester, information on whether			
if announced each (approz	nination (approx. 90 to 180 d by the lecturer, the writte x. 20 minutes) or an oral ex assessment: German, Eng	n examination can be amination in groups	(groups of 2, approx	l examination of one candidate ĸ. 30 minutes)			
Allocation of		<u> </u>					
	-						
Additional ir	nformation						
Workload							
Teaching cy	cle						
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
Bachelor' degree (1 major) Nanostructure Technology (2012)							
Bachelor' degree (1 major) Economathematics (2012)							
Bachelor' degree (1 major) Functional Materials (2012)							

Module title					Abbreviation
Numeri	ical Ma	thematics 2 for other Su	bjects		10-M-NUA-122-m01
Module coordinator				Module offered by	
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	natics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semester undergraduate		Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for			
Conten	ts		admission to assess		
Eigenva	alue pr	oblems, linear programm Ie problems.	ing, methods for initi	al value problems fo	or ordinary differential equations,
Intend	ed lear	ning outcomes			
		acquainted with fundam apply them independent			ods in numerical mathematics,
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
ı) Ü + V	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, e	examination offered — if no	ot every semester, information on whether
if anno each (a	unced pprox.	nation (approx. 90 to 180 by the lecturer, the writte 20 minutes) or an oral ex ssessment: German, Eng	n examination can be camination in groups	(groups of 2, approx	l examination of one candidate ĸ. 30 minutes)
Allocat	<u> </u>				
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
Module	Module appears in				
Bachelor' degree (1 major) Functional Materials (2012)					

Module title Abbreviation					Abbreviation
Progra	nming	course for students of M	athematics and othe	r subjects	10-M-PRG-122-m01
Module coordinator				Module offered by	
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	natics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
3		successfully completed		•	
Duratio		Module level	Other prerequisites		
1 semester undergraduate		sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the set sessment into effect ted to assessment in	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for		
Conten	ts				
		odern programming langu	Jage (e.g.C).		
		ning outcomes			
	dent is	able to work independe	ntly on small program	iming exercises and	standard programming problems
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
P (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	<u>a)</u>
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
beginni	ing of t	form of programming exe he course) ssessment: German, Eng			e specified by the lecturer at the
Allocat					
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
Module	appea	irs in			
Bachelor' degree (1 major) Nanostructure Technology (2012) Bachelor' degree (1 major) Economathematics (2012) Bachelor' degree (1 major) Mathematical Physics (2012) Bachelor' degree (1 major) Functional Materials (2012) First state examination for the teaching degree Gymnasium Mathematics (2012)					

Module title Abbreviation						
Databa	ses				10-I-DB-102-m01	
Module	e coord	inator		Module offered by		
Dean of	fStudi	es Informatik (Compute	r Science)	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5		rical grade		, ,,		
Duratio		Module level	Other prerequisites			
1 seme		undergraduate	Admission prerequi	site to assessment: o ecturer at the beginn		scope to be
Conten	ts		, ,	0	<u> </u>	
		ebra and complex SQL s	statements; database	planning and norma	l forms; transaction	manage-
Intende	ed lear	ning outcomes				
The stu	dents	possess knowledge abc	ut database modellin	g and queries in SQL	as well as transaction	ons.
		number of weekly contact hours				
V + Ü (r	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
		sessment (type, scope, langule for bonus)	lage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
ced by nutes, g Langua	an oral groups ge of a	by the lecturer by four w examination of one car of 2: 20 minutes, group ssessment: German, En	ndidate each or an ora os of 3: 25 minutes)	l examination in grou		
Allocat	ion of p	Diaces				
			_			
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulation	ns for teaching-degree progra	immes)		
		atenbanksysteme und Datenbanksysteme und				
Module	e appea	ars in				
Bachel	or' deg	ree (1 major) Computer	Science (2010)			
	-	ree (1 major) Mathemat				
	-	ree (1 major) Mathemat		`		
	-	ree (1 major) Business I	•	-		
	-	ree (1 major) Computati ree (1 major) Computati				
	-					
	Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011)					
	Bachelor' degree (1 major) Functional Materials (2012)					
	-	ee (1 major) Computer S				
Master	's degr	ee (1 major) Mathematio	CS (2012)			
Bachelor's	achelor's with 1 major Functional Materials (2012) JMU Würzburg • generated 26-Aug-2024 • exam. reg. da- ta record Bachelor (180 ECTS) Funktionswerkstoffe - 2012 page 47 / 75					

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Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Computational Mathematics (2012) First state examination for the teaching degree Realschule Computer Science (2002) First state examination for the teaching degree Gymnasium Computer Science (2009)

Module title Abbreviation					
Introduction	to Computer Science for	Students of all Facult	ies	10-I-EIN-111-m01	
Module coordinator			Module offered by	<u> </u>	
Dean of Stud	ies Informatik (Computer	Science)	Institute of Comput	ter Science	
ECTS Meth	od of grading	Only after succ. con	npl. of module(s)		
10 num	erical grade				
Duration	Module level	Other prerequisites			
1 semester	undergraduate	Admission prerequi		academic requirements to be met ng of the course.	
Contents					
	of computer science inclution that the second structures and data structures and the structures structures are structures as a second structure st			vebsites (HTML, XML, EBNF), data-	
Intended lea	rning outcomes				
				e areas of representation of infor- tures, programming in Java.	
Courses (type,	number of weekly contact hours,	language — if other than Ger	rman)		
V + Ü (no info	ormation on SWS (weekly	contact hours) and co	ourse language avail	lable)	
Method of as module is credita		age — if other than German, o	examination offered — if no	ot every semester, information on whether	
	amination (80 to 90 minu tion in groups of 2 or 3 ca			ate each (approx. 20 minutes) or	
Allocation of	places				
Additional in	formation				
Workload					
Teaching cyc	le				
Referred to in	LPOI (examination regulation	ns for teaching-degree progra	immes)		
Module appe	ars in				
Bachelor' de Master's deg	gree (1 major) Nanostruct gree (1 major) Functional ree (1 major) Psychology	Materials (2012) (2012)			
	Bachelor's degree (1 major, 1 minor) Digital Humanities (Minor, 2012) Bachelor's degree (2 majors) Digital Humanities (2012)				



Compulsory Electives Chemistry

(18 ECTS credits)

Module title Abbreviation					Abbreviation
Progra	amming	course for Chemistry Ma	ijor		08-PKC-102-m01
Modul	e coord	inator		Module offered by	<u>I</u>
lecture	er of lec	ture "Programmierkurs fü	r Chemiker"	Institute of Physica	l and Theoretical Chemistry
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	(not)	successfully completed			
Durati	on	Module level	Other prerequisites		
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-
Conte	nts				
		provides an introduction t d to problems in chemist		of a programming lar	nguage and discusses how they
Intend	led lear	ning outcomes			
Studer chemi		able to describe the fund	amentals of the prog	ramming language a	nd to apply them to problems in
Course	es (type, 1	number of weekly contact hours, I	anguage — if other than Ge	rman)	
S + Ü ((no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)
		s essment (type, scope, langua ble for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether
		nination: completion of p ssessment: German, Eng		s and oral description	on of algorithms used
Alloca	tion of	places			
Additi	onal inf	ormation			
Workle	oad				
Teachi	ing cycl	e			
Referr	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
	e appea				
	-	ree (1 major) Chemistry (2			
	Bachelor' degree (1 major) FOKUS Chemistry (2011) Bachelor' degree (1 major) Functional Materials (2012)				
Bachelor degree (1 major) Functional Materials (2012)					

Module	Module title Abbreviation					
Bioche	Biochemistry for Students of Functional materials 08-BC-TF-122-mo1					
Module coordinator Module offered by						
holder	ofthe	Chair of Biochemistry		Chair of Biochemis	stry	
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	ts					
Compri mistry.	ising le	ctures and exercises, th	is module acquaints s	tudents with the fur	ndamental principles of bioche-	
Intend	ed lear	ning outcomes				
		e become familiar with tl cal processes in cellular		ples of biochemistr	y. They are able to describe the	
Course	S (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
V + Ü (ı	no info	rmation on SWS (weekly	contact hours) and co	ourse language avai	lable)	
		sessment (type, scope, langu ble for bonus)	age — if other than German,	examination offered — if n	ot every semester, information on whether	
or 90 n each (a	ninutes approx.		ations: approx. 60 mir xamination in groups	nutes each) or b) ora	itten examinations: approx. 60 al examination of one candidate x. 30 minutes)	
Allocat	ion of _l	places				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	immes)		
Module	e appea	ars in				
Bachel	Bachelor' degree (1 major) Functional Materials (2012)					

Modul	Module title Abbreviation					
Drug P	Drug Product Development, Quality assurance and industrialization08-PTF2-122-m01					
Module coordinator Module offered by					1	
degree cy)	e progra	amme coordinator FOKUS	Pharmazie (Pharma-	Institute of Pharma	icy and Food Chemistry	
ECTS	Meth	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts	•				
This m	odule d	discusses advanced topic	s in drug product dev	velopment, quality a	ssurance and industrialisation.	
Intend	ed lear	ning outcomes				
		e developed an advanced ion and are able to apply			elopment, quality assurance and	
Course	es (type,	number of weekly contact hours, l	anguage — if other than Ger	rman)		
S (no ii	nforma	tion on SWS (weekly cont	act hours) and cours	e language availabl	e)	
		sessment (type, scope, langua ble for bonus)	ge — if other than German, 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 I examination of one candidate 3. 30 minutes)	
Allocat	tion of	places				
Additio	onal inf	ormation				
Worklo	oad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
Modul	e appe	ars in				
		ree (1 major) Functional N				
Master	Master's degree (1 major) FOKUS Pharmacy (2012)					

Ch				Abbreviation
	nd bio-inspired Nanotech	nology for Material S	Synthesis	08-NT-122-m01
Module coor	dinator		Module offered by	
holder of the thesis	Chair of Chemical Techno	ology of Material Syn-	Chair of Chemical	Fechnology of Material Synthesis
ECTS Met	nod of grading	Only after succ. con	npl. of module(s)	
5 num	erical grade			
Duration	Module level	Other prerequisites	i	
1 semester	graduate			
of analysis u neralisation	sed to characterise the ge and uses examples to intr	nerated materials. It	also discusses the f	istry and discusses the methods undamental principles of biomi- synthesis.
	rning outcomes			
	ve developed an advanced , number of weekly contact hours,		•	mineralisation.
component. • o8-NT-	comprises 2 module com 1-122: V (no information o 2-122: V (no information c	n SWS (weekly conta	ct hours) and course	
low Unloce	stated otherwise success			e components as specified be-
vidual asses Assessment • 2 ECTS • a) writ minute Assessment thesis • 3 ECTS • a) writ minute	sments. in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i	- NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora n groups (groups of 2 - NT-2-122: From Biom erical grade 45 minutes) or b) ora	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or	successful completion of all indi- ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment • 2 ECTS • a) writ minute Assessment thesis • 3 ECTS • a) writ	sments. in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i	- NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora n groups (groups of 2 - NT-2-122: From Biom erical grade 45 minutes) or b) ora	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or	successful completion of all indi- ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment • 2 ECTS • a) writ minute Assessment thesis • 3 ECTS • a) writ minute Allocation of 	sments. in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i f places	- NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora n groups (groups of 2 - NT-2-122: From Biom erical grade 45 minutes) or b) ora	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or	successful completion of all indi- ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment • 2 ECTS • a) writ minute Assessment thesis • 3 ECTS • a) writ minute Allocation of 	sments. in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i f places	- NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora n groups (groups of 2 - NT-2-122: From Biom erical grade 45 minutes) or b) ora	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or	successful completion of all indi ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment • 2 ECTS • a) writ minute Assessment thesis • 3 ECTS • a) writ minute Allocation of Additional in	sments. in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i f places	- NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora n groups (groups of 2 - NT-2-122: From Biom erical grade 45 minutes) or b) ora	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or	successful completion of all indi- ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment 2 ECTS a) writ minute Assessment thesis 3 ECTS a) writ minute Allocation of Additional ir	sments. in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8 5, Method of grading: num- ten examination (approx. es) or c) oral examination i f places	- NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora n groups (groups of 2 - NT-2-122: From Biom erical grade 45 minutes) or b) ora	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or	successful completion of all indi ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment 2 ECTS a) writ minute Assessment thesis 3 ECTS a) writ minute Allocation of Additional ir	sments. in module component o8- b, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8- b, Method of grading: num- ten examination (approx. es) or c) oral examination i places formation	- NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora n groups (groups of 2 - NT-2-122: From Biom erical grade 45 minutes) or b) ora	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or	successful completion of all indi ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment 2 ECTS a) writ minute Assessment thesis 3 ECTS a) writ minute Allocation of Additional ir Workload	sments. in module component o8- b, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8- b, Method of grading: num- ten examination (approx. es) or c) oral examination i places formation	- NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora n groups (groups of 2 - NT-2-122: From Biom erical grade 45 minutes) or b) ora	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or	successful completion of all indi ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment 2 ECTS a) writ minute Assessment thesis 3 ECTS a) writ minute Allocation of Additional ir Workload Teaching cye	sments. in module component o8- b, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8- b, Method of grading: num- ten examination (approx. es) or c) oral examination i places formation	-NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora in groups (groups of 2 -NT-2-122: From Biom erical grade 45 minutes) or b) ora in groups (groups of 2	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or 2, approx. 30 minute	successful completion of all indi- ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment 2 ECTS a) writ minute Assessment thesis 3 ECTS a) writ minute Allocation of Additional ir Workload Teaching cye	sments. in module component o8- b, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8- b, Method of grading: num- ten examination (approx. es) or c) oral examination i places iformation	-NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora in groups (groups of 2 -NT-2-122: From Biom erical grade 45 minutes) or b) ora in groups (groups of 2	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or 2, approx. 30 minute	successful completion of all indi- ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20
vidual asses Assessment 2 ECTS a) writ minute Assessment thesis 3 ECTS a) writ minute Allocation of Additional ir Workload Teaching cyo Referred to i	sments. in module component o8- i, Method of grading: num- ten examination (approx. es) or c) oral examination i in module component o8- i, Method of grading: num- ten examination (approx. es) or c) oral examination i places if places formation cle n LPO I (examination regulation	-NT-1-122: Sol-Gel Ch erical grade 45 minutes) or b) ora in groups (groups of 2 -NT-2-122: From Biom erical grade 45 minutes) or b) ora in groups (groups of 2	module will require emistry 1: Fundamen al examination of or 2, approx. 30 minute nineralisation to biol al examination of or 2, approx. 30 minute	successful completion of all indi ntals ne candidate each (approx. 20 es) logically inspired Materials Syn- ne candidate each (approx. 20

Bachelor's with 1 major Functional Materials (2012)

JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Funktionswerkstoffe - 2012

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Bachelor' degree (1 major) Functional Materials (2012) Master's degree (1 major) Chemistry (2013) Master's degree (1 major) Technology of Functional Materials (2010) Master's degree (1 major) Technology of Functional Materials (2009) Master's degree (1 major) Functional Materials (2012)



Compulsory Electives Medicine

(20 ECTS credits)

Module title				Abbreviation			
Technology of Composite Materials (Lecture and practical course)					03-FU-TV-122-m01		
Module	coord	inator		Module offered by			
holder of the Chair of Functional Materials in Medicine and Faculty of Medicine Dentistry							
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	undergraduate					
Content	ts						
Theoret sandwi		d practical fundamental erials.	knowledge of the fab	rication and evaluat	ion of composite res	pectively	
Intende	ed learı	ning outcomes					
Student	ts have	e developed a deep know	ledge about the fabri	cation and evaluation	on of sandwich mate	rials.	
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
compor • o	hent. 3-FU-TV	omprises 2 module comp /-1-122: V (no information /-2-122: P (no information	n on SWS (weekly cor	ntact hours) and cou	rse language availab	ole)	
Method	l of ass	sessment (type, scope, langua le for bonus)	· · · · · · · · · · · · · · · · · · ·	·			
low. Un vidual a Assessi 3 3 3 3 3 4 6 6 6 6 6 6 6 6 6 6 6 7 6 8 5 8 5 8 5 8 5 8 9 8 9 8 9 9 9 9 9 9 9	less st assessi ECTS, 1 to 3 o or 90 andida anguag ment in ECTS, ortesta ssessin anguag	module component o3- Method of grading: nume written examinations (1 w o minutes each; 3 written te each (approx. 20 minu ge of assessment: Germa n module component o3- Method of grading: (not) te (pre-experiment exam nent offered: once a year ge of assessment: Germa	FU-TV-1-122: Technol erical grade rritten examination: a examinations: appro utes) or c) oral examir n, English if agreed u FU-TV-2-122: Techno successfully complet s, approx. 15 minutes , summer semester	module will require s ogy of Composite Ma pprox. 90 minutes; 2 px. 60 minutes each) nation in groups (gro pon with the examin logy of Composite M ted s each) and logs (app	aterials (Lecture) written examination or b) oral examinati ups of 2, approx. 30 er aterials (Practical co prox. 5 pages each)	on of all indi- is: approx. ion of one minutes)	
Additio	nal inf	ormation					
Worklo	ad						
	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	appea	irs in					
Bachelor's v	with 1 maj	or Functional Materials (2012)		generated 26-Aug-2024 • exa or (180 ECTS) Funktionswerks	-	page 57 / 75	

Module title					Abbreviation		
Functionalized Biomaterials					03-FU-FBM-122-m01		
Module	coord	inator		Module offered by			
holder o Dentisti		Chair of Functional Mater	ials in Medicine and	Faculty of Medicine			
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
5	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	undergraduate					
Content	ts						
		principles and specific ki ication and characterisat		in natural sciences i	in the field of biomaterials with		
Intende	d learr	ning outcomes					
Student	ts have	e developed an advanced	knowledge in the fie	ld of biomaterials fo	r use in implants.		
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
compor • o	nent. 3-FU-FE	3M-1-122: V (no informati	ion on SWS (weekly c	ontact hours) and co	sted separately for each module ourse language available) ourse language available)		
Method	of ass		· · · ·		t every semester, information on whether		
vidual a Assessi a a a ca ca Assessi 2 Vi A	ment ir ECTS, 1 to 3 v o or 9 co andida anguag ment ir ECTS, ortesta ssessn anguag	ments. n module component 03 - Method of grading: nume written examinations (1 w o minutes each; 3 written te each (approx. 20 minu ge of assessment: Germa n module component 03 - Method of grading: (not) ite (pre-experiment exam- ment offered: once a year ge of assessment: Germa	FU-FBM-1-122: Functi erical grade written examination: a examinations: appro- utes) or c) oral examir n, English if agreed u FU-FBM-2-122: Funct successfully comple- is, approx. 15 minutes , summer semester	onalized Biomateria pprox. 90 minutes; 2 bx. 60 minutes each) nation in groups (gro pon with the examin ionalized Biomateria ted s each), logs (approx	written examinations: approx. or b) oral examination of one ups of 2, approx. 30 minutes) er als (Practical course) a. 5 pages each)		
Additio	nal info	ormation	<u> </u>				
Worklo	ad						
Teachin	ig cycl	e					
			-				
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)			
Module	appea	in in					
Bachelor's v	vith 1 maj	or Functional Materials (2012)		generated 26-Aug-2024 • exa or (180 ECTS) Funktionswerks			

Module title					Abbreviation	
Polymer Chemistry					03-FU-PM1-122-m01	L
Module coordinator Module				Module offered by		
holder of the Chair of Functional Materials in Medicine and Faculty of Medicine Dentistry						
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Content	ts					
radical	polyme	s of polymerisation: fre erisations; characterisa lysis, mass spectromet	tion of polymers and p			
Intende	d learr	ning outcomes				
The sturn risation		are familiar with the fur	damentals of polymer	chemistry and the re	elated methods for th	ieir characte-
Courses	5 (type, n	umber of weekly contact hours	s, language — if other than Ger	man)		
compor • o	nent. 3-FU-Pl	omprises 2 module cor M1-1-122: V (no informa M1-2-122: P (no informa	tion on SWS (weekly c	ontact hours) and co	urse language availa	able)
Method	l of ass	essment (type, scope, lang	· · ·			
	less st	n this module comprise ated otherwise, succes ments.				
 3 a) 60 Ca La Assessi 2 Va Asis 	ECTS,) 1 to 3 v o or 9 c andida anguag ment ir ECTS, ortesta ssessn	module component o Method of grading: nur written examinations (1 o minutes each; 3 writte te each (approx. 20 mi ge of assessment: Germ module component o Method of grading: (no te (pre-experiment exa nent offered: once a ye ge of assessment: Germ	nerical grade written examination: a en examinations: appro- nutes) or c) oral examin an, English if agreed u 3-FU-PM1-2-122: Polym t) successfully comple- ms, approx. 15 minutes ar, summer semester	pprox. 90 minutes; 2 ox. 60 minutes each) nation in groups (gro pon with the examin per Chemistry (Practi- ted s each) and logs (app	written examination or b) oral examination ups of 2, approx. 30 er cal course) prox. 5 pages each)	ion of one
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Workloa	Workload					
Teachin	ig cycl	e				
Referre	d to in	LPOI (examination regulation	ons for teaching-degree progra	mmes)		
Bachelor's v	with 1 maj	or Functional Materials (2012)	-	generated 26-Aug-2024 • exa or (180 ECTS) Funktionswerks	-	page 61 / 75

Module appears in

Bachelor' degree (1 major) Functional Materials (2012) Master's degree (1 major) Chemistry (2013)

Module title					Abbreviation	
Principles of Tissue Engineering					03-FU-TE-122-m01	
Module	coord	inator		Module offered by		
holder	of the C	Chair of Regenerative Mee	licine	Faculty of Medicine		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
		ations of organ and tissu of tissue engineering, 2D	-		olantation, cell culture technolo- ogy.	
Intende	ed learr	ning outcomes				
	xenotra	ansplantation, cell cultur		-	and tissue damage, medical im- ering, 2D and 3D tissue models,	
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)		
S + Ü (n	io infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		e essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
one of t questio d) oral (tes)	he follo ns) or l examin	owing options will be cho b) log (approx. 10 to 30 p	osen: a) written exam ages) or c) oral exam 3 candidates (approx	ination (30 to 60 min ination of one candi . 30 to 60 minutes) c	nt prior to the course. Usually, nutes, including multiple choice date each (30 to 60 minutes) or or e) presentation (20 to 45 minu-	
Allocati						
Additio	nal info	ormation				
Worklo	ad					
Teachir	ng cycl	9				
Referre	d to in	LPOI (examination regulations	for teaching-degree progra	mmes)		
Module	appea	in and the second se				
Bachelor' degree (1 major) Functional Materials (2012)						



Compulsory Electives Additional Qualifications

(20 ECTS credits)

Module	Module title Abbreviation					
Indust	rial Inte	ernship (Short)			08-FU-IP1-122-m01	
Modul	e coord	inator		Module offered by		
Dean o	of Studi	es Funktionswerkstoffe (I	Functional Materials)	Chair of Chemical T	echnology of Material Synthesis	
ECTS	Meth	od of grading	Only after succ. con	pl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	undergraduate				
Conten	nts					
red in t	the con		gramme in Functiona		e contents of a lab course offe- S credits); please consult with	
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	S (type, r	number of weekly contact hours, I	language — if other than Ger	man)		
P (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	2)	
		Sessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
		(approx. 5 to 10 pages) ssessment: German, Eng	lish if agreed upon w	ith the examiner		
Allocat			. <u> </u>			
Additio	onal inf	ormation				
Worklo	bad					
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Bachelor' degree (1 major) Functional Materials (2012)						

Module title					Abbreviation
Foreign Studies (Short)					08-FU-APM1-122-m01
Module	e coord	inator		Module offered by	
Erasmı ctional			ionswerkstoffe (Fun-	Chair of Chemical T	echnology of Material Synthesis
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	(not) s	successfully completed			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate	Admission prerequi	site to assessment:	regular attendance of placement
Conten	ts				
course sult wi	offered th the c	d in the context of the Ma competent coordinator in	ster's programme in		rrespond to the contents of a lab (120 ECTS credits); please con-
		ning outcomes			
		amiliar with procedures a subject-specific skills as			ntries other than Germany. They s.
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
P (no ir	format	tion on SWS (weekly cont	act hours) and cours	e language available	<u>a)</u>
		s essment (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether
		k. 2 pages); proof of havin ssessment: German or E			nent country where required
Allocat					
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	mmes)	
Module	Module appears in				
Bachel	or' deg	ree (1 major) Functional N	Aaterials (2012)		

Module title Abbreviation						
Course	Courses related to Functional Materials outside of the Natural Sciences 08-FU-WP1-122-m01					
Module	e coord	inator		Module offered	by	
Dean o	of Studi	es Funktionswerkstoffe (I	Functional Materials)	Chair of Chemic	cal Technology of Material Synthesis	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	(not) s	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate	Please consult with	course advisory	service.	
Conten	nts					
offered dents I	l by oth MUST c	er Faculties and are not e onsult with their course a	explicitly included in t		al materials-related courses that are gulations for their programmes. Stu-	
		ning outcomes				
		e developed the knowled			lended by them.	
		number of weekly contact hours, I			-11-1	
		ion on SWS (weekly cont				
		Gessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered –	- if not every semester, information on whether	
or 90 n te each comple	ninutes n (appro etion as	each; 3 written examina	tions: approx. 60 min examination in group	nutes each) or b) os (groups of 2, a	written examinations: approx. 60 oral examination of one candida- approx. 30 minutes) or d) successful	
Allocat	tion of _l	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	ars in				
Bachel	or' deg	ree (1 major) Functional N	Materials (2012)			

Module title Abbreviation					
Course	Courses related to Functional Materials inside of the Natural Sciences 08-FU-WP2-122-mo1				
Module coordinator				Module offere	d by
Dean o	f Studi	es Funktionswerkstoffe (I	Functional Materials)	Chair of Chem	ical Technology of Material Synthesis
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s	5)
5	(not) s	successfully completed			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate	Please consult with	course advisory	y service.
Conten	ts				
offered dents N	by oth AUST c	er Faculties and are not e onsult with their course a	explicitly included in t		nal materials-related courses that are egulations for their programmes. Stu-
		ning outcomes	a and skills taught i	n the courses a	ttandad by tham
		e developed the knowled			
					ilabla)
		tion on SWS (weekly cont			
		le for bonus)	ge — If other than German, e	examination offered	 if not every semester, information on whether
or 90 m te each comple	ninutes (appro etion as	each; 3 written examina	tions: approx. 60 min examination in group	nutes each) or b os (groups of 2,	2 written examinations: approx. 60) oral examination of one candida- approx. 30 minutes) or d) successful er
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	mmes)	
Module	e appea	urs in			
		ree (1 major) Functional N	Materials (2012)		



Thesis

(12 ECTS credits)

Module title					Abbreviation
Bachelor Thesis Functional Materials				08-FU-BT-122-m01	
Module	e coord	inator		Module offered by	
Dean o	fStudie	es Funktionswerkstoffe (F	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
12	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate	By way of exception, assessments.	, additional prerequi	sites are listed in the section on
Conten	ts				
		ives students the opport scientific methods they h			oroblem within a given time frame
Intende	ed leari	ning outcomes			
		ble to conduct research to present the results of t			the principles of good scientific
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
• 0	8-FU-B	as 2 components; inform T-2-122: K (no informatio T-1-122: A (no information	n on language and ni	umber of weekly con	tact hours available)
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
This mo	dule h	as the following 2 assess	sment components. L	Inless stated otherw	ise, students must pass all of
these a	ssessn	nent components to pass	the module as a who	ole	
• 2 • A	ECTS o bschlu	omponent to module con redits, method of gradin sskolloquium mit talk (aj	g: numerical grade oprox. 20 minutes) ar		
Assess • 1 • w • L • C	ment c o ECTS vritten t anguag other pr	ge of assessment: Germa omponent to module con credits, method of gradin hesis (approx. 20-40 pag ge of assessment: Germa rerequisites: Where appli (cf. Section 12 Subsection	nponent o8-FU-BT-1-1 ng: numerical grade ges) n or English cable, topic-specific	modules/module cc	omponents as specified by su-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
• 0	8-FU-B	ormation listed separatel T-1-122: Additional inforn T-2-122:			
Worklo	ad				
Teachi	ıg cycl	9			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
Module	e appea	irs in			



Subject-specific Key Skills

(15 ECTS credits)

Module title				Abbreviation	
Material Science 1 (basic introduction)					08-FS1-122-m01
Module coordinator Module offered by					
Dean of	f Studi	es Funktionswerkstoffe (F	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis
ECTS	Meth	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
		liscusses the fundamenta rties of materials.	al relations between o	chemical bonding, th	ne structure, the microstructure
Intende	ed lear	ning outcomes			
					al bonding, the structure, the to apply them to research pro-
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
V + Ü (r	no info	rmation on SWS (weekly o	contact hours) and co	urse language avail	able)
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
or 90 m each (a	ninutes pprox.		tions: approx. 60 min amination in groups (utes each) or b) oral	tten examinations: approx. 60 l examination of one candidate . 30 minutes)
Allocat					
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	ars in			
		ree (1 major) Nanostructu	re Technology (2012)		
Bachel	Bachelor' degree (1 major) Functional Materials (2012)				
Master's degree (1 major) Chemistry (2013)					

Module title					Abbreviation	
Material Science 2 (the material groups)					08-FS2-122-m01	
Module	e coord	inator		Module offered by		
Dean o	fStudi	es Funktionswerkstoffe (F	unctional Materials)	Chair of Chemical T	echnology of Material Synthesis	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
This m	odule d	eals with the fabrication	and properties of the	main material grou	ps.	
Intend	ed lear	ning outcomes				
		e developed a knowledge knowledge to research pr		d properties of the n	nain material groups and are able	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
V + Ü (I	no infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
or 90 n each (a	ninutes approx.		tions: approx. 60 min amination in groups (utes each) or b) oral	ten 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				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	urs in				
	-	ree (1 major) Nanostructu				
	-	ree (1 major) Functional N				
Master	Master's degree (1 major) Chemistry (2013)					

Module title					Abbreviation	
Modern Bio Analytical Methods					08-MAM-122-m01	
Module coordinator				Module offered by		
Dean of Studies Funktionswerkstoffe (Functional Materials)				Chair of Chemical Technology of Material Synthesis		
ECTS	ECTS Method of grading Only after succ. compl. of module			pl. of module(s)		
5 numerical grade						
Duration		Module level	Other prerequisites			
1 semester undergraduate			<u></u>			
Contents						
Analytical principles, gravimetric methods, titration, chromatography, spectroscopic methods (UV-VIS, IR, Ra- man, emission, fluorescence, NMR etc.), surface analysis, structure analysis.						
Intended learning outcomes						
Students have developed modern analytics expertise.						
Courses (type, number of weekly contact hours, language — if other than German)						
 This module has 2 components; information on courses listed separately for each component. o8-MAM-1-122: V (no information on language and number of weekly contact hours available) o8-MAM-2-122: P (no information on language and number of weekly contact hours available) 						
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)						
This module has the following 2 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole						
 Assessment component to module component o8-MAM-1-122: Moderne Bio-Analytik 3 ECTS credits, method of grading: numerical grade a) 1-3 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 on candidate each (approx. 20 minutes) or c) oral examination in groups (groups of two, approx. 30 minutes). Language of assessment: German or English Assessment component to module component o8-MAM-2-122: Praktikum zu Moderne Bio-Analytik 2 ECTS credits, method of grading: (not) successfully completed Vortestate (je approx. 15 minutes) and logs (je approx. 5 pages) Assessment offered once a year, summer semester. Language of assessment: German or English 						
Allocation of places						
Additional information Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	irs in				
	Bachelor' degree (1 major) Functional Materials (2012)					