

Subdivided Module Catalogue for the Subject

Technology of Functional Materials

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

Examination regulations version: 2009 Responsible: Faculty of Chemistry and Pharmacy

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Course of Studies - Contents and Objectives

The curriculum of Bachelor of Science program with specialization in Technology of Functional Materials is intended to provide students with hands-on practical experience in the field of functional materials for advanced technologies. This program offers students the opportunity to acquire basic knowledge and comprehensive understanding of key techniques commonly related to modern functional materials. It is an interdisciplinary course which involves lectures dealing with basic principles of chemistry, physics, mathematics, engineering, electronics and materials science. This course is closely coordinated by Fraunhofer Institut für Silicatforschung, Fachhochschule Würzburg-Schweinfurt, Bayerischen Zentrum für Angewandte Energieforschung and Süddeutschen Kunststoffzentrum. Through this course students are given an opportunity to become well-educated and well-rounded individuals with a broad range of skills. In the bachelors thesis process, the students are supposed to demonstrate their ability to apply their theoretical and practical knowledge and to solve material science related problems. The bachelors certification enables students to qualify for scientific occupation in the field of functional materials for advanced technologies. Moreover, students are encouraged to do additional industrial internships or Master of Science to further develop their knowledge and skills.

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:

ASP02007

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

21-Jul-2009 (2009-42) except module 08-PKC-072 which has been replaced by 08-PKC-092

05-Oct-2009 (2009-85)

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

The subject is divided into

Abbreviation	Module title	ECTS credits	Method of grading	page
Compulsory Courses (143	ECTS credits)		•	
08-IAC-062-m01	Experimental Chemistry, General and analytical laboratory course for engineering students	10	NUM	15
08-IOC-062-m01	Organic Chemistry for students of medicine, biomedicine, den- tal medicine, engineering and natural science	10	NUM	17
99-TM-062-m01	Fundamentals of Engineering Mechanics	5	NUM	54
11-MPI3-062-m01	Mathematics 3 for students of Physics and Engineering	8	NUM	44
11-ENNF1-062-m01	Introduction to Physics Part 1 for students of Physics Related Minor Subjects	7	NUM	42
11-ENNF2-062-m01	Introduction to Physics Part 2 for students of Physics Related Minor Subjects	7	NUM	43
11-PNNF-062-m01	Physics Laboratory Course for students of Physics Related Mi- nor Subjects	3	B/NB	47
08-BKOLL-062-m01	Bachelor Thesis' Colloquium	3	NUM	10
03-TV-091-m01	Technology of Composite Materials and Technology of Compo- site Materials laboratory course	5	NUM	7
10-M-TFU1-091-m01	Mathematics 1 for students of Technology of Functional Materi-		NUM	40
10-M-TFU2-091-m01	o-M-TFU2-091-mo1 Mathematics 2 for students of Technology of Functional Mate-		NUM	41
08-IPC-091-m01	3-IPC-091-m01 Physical Chemistry for engineering students (lecture and labo- ratory course)		NUM	21
99-EL1-091-m01	Basics of Electronics 1	5	NUM	51
99-EL2-091-m01	Basics of Electronics 2	5	NUM	52
99-CA-091-m01	Computer-based Construction and Assembly (CAD/CAM)	6	NUM	50
99-IP-091-m01	Laboratory Course on Engineering (mechanical and electrical engineering)	6	B/NB	53
11-TMS-091-m01	Physical Technology of Material Synthesis. Lecture, exercises	5	NUM	49
11-PPT-091-m01	Laboratory course on Physical Technology of Material Synthe- sis	5	B/NB	48
08-MAM-091-m01	Modern Analytical Methods (lecture and laboratory course)	5	NUM	23
08-10C-062-m02	Organische Chemie für Studierende der Ingenieurwissenschaf- ten	10	NUM	19
08-CT-091-m01	Chemical Technology of Material Synthesis. Lecture, exercises	10	NUM	12
Compulsory Electives (5 E	CTS credits)			
10-I-EPIN-062-m01	Introduction to computer science of all faculties	5	NUM	27
10-I-DB-072-m01	Data bases	5	NUM	26
11-N1-072-m01	Basics of NanostructureTechnology	6	NUM	46
10-M-ODE-082-m01	Ordinary Differential Equations	5	NUM	36
08-BC-TF-062-m01	Biochemistry for students of Technology of Functional Materi- als	3	NUM	8
08-PKC-092-m01	Programming course for Chemistry Majors	5	B/NB	25



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08-NT-091-mo1 rials Synthesis		5	NUM	24		
08-BC-TF-082-m01	Biochemistry for Engineering Majors	3	NUM	9		
03-TF-FBM-082-mo1 Functional Biomaterials for students of Technology of Functio- nal Materials		5	NUM	6		
10-M-FAN-072-m01	10-M-FAN-072-mo1 Introduction to Functional Analysis		NUM	30		
10-M-NM1-082-m01	o-M-NM1-082-mo1 Numerical Mathematics 1		NUM	32		
10-M-NM2-082-m01	o-M-NM2-082-mo1 Numerical Mathematics 2		NUM	34		
10-M-PRG-082-mo1 Programming course for students of Mathematics and other subjects		3	B/NB	38		
10-M-COM-082-m01	10-M-COM-082-mo1 Computeroriented Mathematics		B/NB	28		
Subject-specific Key Skills (10 ECTS credits)						
08-FS2-062-m01	Material Science 2 (the material groups)	5	NUM	14		
08-FS1-091-m01	Material Science 1 (basic introduction)	5	NUM	13		
Thesis (12 ECTS credits)				ñ		
08-BT-062-m01 Bachelor's Thesis		12	NUM	11		

Modul	e title				Abbreviation	
Functio	onal Bi	omaterials for students	of Technology of Func	tional Materials	03-TF-FBM-082-m01	
Modul	e coord	linator		Module offered by		
holder of the Chair of Functional Materials in Medicine and Faculty of Medicine Dentistry				2		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5	nume	erical grade				
Duratio	on	Module level	Other prerequisites	i		
1 seme	ster	undergraduate				
Conter	nts					
		principles and specific k fication and characterisa		; in natural sciences	in the field of biomaterials with	
Intend	ed lear	ning outcomes				
Studer	nts hav	e developed an advance	d knowledge in the fie	eld of biomaterials fo	or use in implants.	
Course	es (type	, number of weekly cont	act hours, language –	- if other than Germa	an)	
V + P (I	no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)	
ster, in	format	ion on whether module of	an be chosen to earn	a bonus)	ation offered — if not every seme-	
		ical course (approx. 10 p		ining / report on pra	ctical course / project report / re-	
Allocat	tion of	places				
Additio	onal inf	formation				
Worklo	ad					
Teachi	ng cyc	le				
Referre	ed to in	LPOI (examination reg	ulations for teaching-	degree programmes))	
Modul	e appe	ars in				
Bachelor' degree (1 major) Technology of Functional Materials (2009)						

Module title					Abbreviation	
Technology of Composite Materials and Technology of Composite Materials				03-TV-091-m01		
laborat	-					
Module				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)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Theoret sandwi		-	knowledge of the fab	rication and evaluat	ion of composite respectively	
Intende	ed leari	ning outcomes				
		e developed a knowledge ch materials.	of the theoretical an	d practical foundatio	ons of the fabrication and evalua-	
Courses	s (type	, number of weekly conta	ct hours, language —	if other than Germa	n)	
compor • o	nent. 3-TV-1-	omprises 2 module comp 091: V (no information or 091: P (no information or	n SWS (weekly contac	t hours) and course		
	-	· · · · · · · · · · · · · · · · · · ·	•			
ster, inf	formati	on on whether module ca	an be chosen to earn	a bonus)	tion offered — if not every seme-	
	less st	ated otherwise, successf			e components as specified be- successful completion of all indi-	
• 3 • w Assess	 Assessment in module component og-TV-1-og1: Technology of Composite Materials 3 ECTS, Method of grading: numerical grade written examination (60 minutes) Assessment in module component og-TV-2-og1: Technology of Composite Materials, laboratory course 2 ECTS, Method of grading: (not) successfully completed oral examination (approx. 15 minutes) 					
Allocati	ion of p	olaces				
Additio	Additional information					
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Referre						
		ve in				
Module						
Bachelor' degree (1 major) Technology of Functional Materials (2009)						

Module title Abbreviation						
Biochemistry for students of Technology of Functional Materials 08-BC-TF-062-mo1					08-BC-TF-062-m01	
Modul	e coord	inator		Module offered by	·	
holder	ofthe	Chair of Biochemistry		Chair of Biochemis	try	
ECTS		od of grading	Only after succ. con	npl. of module(s)		
3		rical grade				
Duratio	-	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten						
Compri mistry.	-	ctures and exercises, thi	s module acquaints s	tudents with the fur	ndamental principles of bioche-	
Intend	ed lear	ning outcomes				
		e become familiar with th cal processes in cellular s		ples of biochemistry	y. They are able to describe the	
Course	s (type	, number of weekly conta	act hours, language –	- if other than Germa	an)	
V + Ü (I	no info	rmation on SWS (weekly	contact hours) and co	ourse language avai	lable)	
		sessment (type, scope, la ion on whether module c			ation offered — if not every seme-	
written	exami	nation (60 minutes)				
Allocat	ion of _l	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Bachel	or' deg	ree (1 major) Technology	of Functional Materia	als (2009)		
Bachel	or' deg	ree (1 major) Technology	of Functional Materia	als (2006)		

Module	Module title Abbreviation					
Bioche	mistry	for Engineering Majors			08-BC-TF-082-m01	
Module	e coord	inator		Module offered by		
holder	of the (Chair of Biochemistry		Chair of Biochemis	trv	
ECTS		od of grading	Only after succ. con	•		
3	nume	rical grade		•		
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Compri mistry.	sing le	ctures and exercises, this	s module acquaints s	tudents with the fun	damental principles of bioche-	
Intende	ed lear	ning outcomes				
		e become familiar with th cal processes in cellular s		ples of biochemistry	r. They are able to describe the	
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	n)	
V + Ü (r	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
		sessment (type, scope, la on on whether module ca			tion offered — if not every seme-	
written	exami	nation (60 minutes)				
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
	-					
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
	-	ree (1 major) Technology				
Bachelor' degree (1 major) Technology of Functional Materials (2010)						

Modul	Module title Abbreviation						
Bachel	Bachelor Thesis' Colloquium				08-BKOLL-062-m01		
Modul	e coord	inator		Module offered by			
Dean c	of Studi	es Funktionswerkstoffe (I	Functional Materials)		echnology of Material Synthesis		
ECTS		od of grading	Only after succ. com				
3	nume	rical grade		-			
Duratio	on	Module level	Other prerequisites				
1 seme	ester	undergraduate					
Conter	nts						
Bachel	lor's the	esis defence.					
Intend	ed lear	ning outcomes					
Studer	nts are a	able to orally defend thei	r Bachelor's thesis.				
Course	es (type	, number of weekly conta	ct hours, language –	- if other than Germa	n)		
K (no i	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	2)		
ster, in	Iformat	sessment (type, scope, la ion on whether module ca um (60 minutes)			tion offered — if not every seme-		
	tion of						
Allocu							
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Modul	e appea	ars in					
Bachel	Bachelor' degree (1 major) Technology of Functional Materials (2009)						
Bachel	Bachelor' degree (1 major) Technology of Functional Materials (2010)						
Bachel	lor' deg	ree (1 major) Technology	of Functional Materia	als (2006)			

Module	e title				Abbreviation
Bachel	or's Th	esis			08-BT-062-m01
Module	e coord	inator		Module offered by	
			Functional Materials)	¥	echnology of Material Synthesis
ECTS		od of grading	Only after succ. con		echnology of Material Synthesis
12		rical grade			
Duratio		Module level	Other prerequisites		
1 seme	ster	undergraduate		essment on a contin	uous basis as agreed upon with
Conten	its				
		ives students the opport scientific methods they l			problem within a given time frame
Intende	ed lear	ning outcomes			
		able to conduct research to present the results of t			the principles of good scientific
Course	s (type	, number of weekly conta	ct hours, language —	if other than Germa	in)
no cou	rses as	signed			
		sessment (type, scope, la ion on whether module ca			tion offered — if not every seme-
written Langua		ssessment: German or Ei	nglish		
Allocat	ion of	places			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Technology of Functional Materials (2006)					

ECTS Method of grading Only after succ. compl. of module(s) 10 numerical grade Duration Module level Other prerequisites 1 semester undergraduate Contents This module discusses the theoretical and practical principles of the chemical technology of material synthesis. Intended learning outcomes Students have become familiar with the theoretical and practical principles of the chemical technology of material synthesis and are able to apply the knowledge they have developed to research problems. 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. Object colspan="2">Object colspan="2"
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thod of grading merical grade Module level undergraduate e discusses the fundamenta operties of materials. earning outcomes ave become familiar with th	Functional Materials) Only after succ. com Other prerequisites al relations between o					
Idies Funktionswerkstoffe (F thod of grading merical grade Module level undergraduate e discusses the fundamenta operties of materials. arning outcomes ave become familiar with th	Only after succ. com Other prerequisites al relations between o	Chair of Chemical Technology of Material Synthesis npl. of module(s)				
thod of grading merical grade Module level undergraduate e discusses the fundamenta operties of materials. earning outcomes ave become familiar with th	Only after succ. com Other prerequisites al relations between o	Chair of Chemical Technology of Material Synthesis npl. of module(s)				
thod of grading merical grade Module level undergraduate e discusses the fundamenta operties of materials. earning outcomes ave become familiar with th	Only after succ. com Other prerequisites al relations between o	npl. of module(s)				
Module level undergraduate e discusses the fundamenta operties of materials. earning outcomes ave become familiar with th	al relations between o					
undergraduate e discusses the fundamenta operties of materials. earning outcomes ave become familiar with th	al relations between o					
e discusses the fundamenta operties of materials. carning outcomes ave become familiar with th		chemical bonding, the structure, the microstructure				
operties of materials. earning outcomes ave become familiar with th		chemical bonding, the structure, the microstructure				
operties of materials. earning outcomes ave become familiar with th		chemical bonding, the structure, the microstructure				
ave become familiar with th	o fundamental relatio					
	o fundamental relation					
		ons between chemical bonding, the structure, the eveloped the ability to apply them to research pro-				
pe, number of weekly conta	act hours, language —	- if other than German)				
formation on SWS (weekly	contact hours) and co	ourse language available)				
assessment (type, scope, la nation on whether module ca		an German, examination offered — if not every seme- a bonus)				
mination (90 minutes)						
of places						
information						
	_					
ycle	-					
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Bachelor' degree (1 major) Technology of Functional Materials (2009)						
	of places information ycle in LPO I (examination regu	of places information ycle in LPO I (examination regulations for teaching-or pears in				

Module	e title				Abbreviation		
Material Science 2 (the material groups)				08-FS2-062-m01			
Module	e coord	inator		Module offered by			
Dean o	f Studi	es Funktionswerkstoffe (F	Functional Materials)	Chair of Chemical T	echnology of Material Synthesis		
ECTS		od of grading	Only after succ. com	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
This mo	odule d	eals with the fabrication	and properties of the	e main material grou	ps.		
Intende	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	, number of weekly conta	ct hours, language —	- if other than Germa	n)		
V + Ü (r	no infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
		essment (type, scope, la on on whether module ca			tion offered — if not every seme-		
written	exami	nation (60 minutes)					
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						
	Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2006)						

Module title		Abbreviation					
Experimental Chemistry, General and analytical laboratory course for enginee- 08-IAC-062-m01							
ring students							
Module coord			Module offered by				
lecturer of lec Chemistry)	ture "Experimentalchemi	e" (Experimental	Institute of Inorgani	ic Chemistry			
i	od of grading	Only after succ. com	pl. of module(s)				
10 nume	rical grade						
Duration	Module level	Other prerequisites					
1 semester	undergraduate						
Contents							
This module provides students with an overview of the fundamental principles of chemistry. It focuses on partic- les, metals, acid-base reactions, the periodic table, chemical equilibrium and complexometry. In addition, the module introduces fundamental models of chemistry and principles of inorganic chemistry. It includes practical exercises based on the lecture on experimental chemistry and its extension. After a safety briefing, the students autonomously conduct experiments in the laboratory. The course focuses on laboratory safety, simple lab techni- ques, the synthesis of simple substances and analyses of unknown substances. In addition, students have the opportunity to advance their laboratory knowledge. Intended learning outcomes Students are able to explain the principles of the periodic table and to extract information from it. They are ab- le to explain basic models of the structure of matter. They have developed the ability to use the language of che- mical formulas to describe chemical reactions and to interpret them by identifying the type of reaction. Students are able to describe the main quantitative and qualitative analytical methods and their application areas. They are able to identify fundamental problems in chemistry and perform experiments to solve them. They have deve-							
	ity to perform the necess anner, both in written an		lculations and descr	ibe the chemical processes in an			
Courses (type	, number of weekly conta	ct hours, language —	· if other than Germa	n)			
component. • o8-IAC-:	omprises 2 module comp 1-062: V (no information o 2-062: P (no information o	on SWS (weekly conta	act hours) and cours				
	sessment (type, scope, la ion on whether module ca			tion offered — if not every seme-			
	ated 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-o62: General and analytical Chemistry Lab for engineering students 5 ECTS, Method of grading: (not) successfully completed Vortestate (pre-experiment exams, approx. 15 minutes each), assessment of practical performance, Nachtestate (post-experiment exams, approx. 15 minutes each) 							
Allocation of places							
Additional inf	ormation						
Workload							

Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Technology of Functional Materials (2006)

Module ti	itle				Abbreviation
Organic Chemistry for students of medicine, biomedicine, dental medicine, en					08-IOC-062-m01
-		natural science			
Module c				Module offered by	
für Studie	erend	ervisor "Organisch-chem e der Ingenieurwissenscl		Institute of Organic	Chemistry
		d of grading	Only after succ. com	pl. of module(s)	
		ical grade			
Duration		Module level	Other prerequisites		
1 semeste		undergraduate			
Contents					
		rovides students with an fundamental techniques			organic chemistry. In addition, it
Intended	learn	ing outcomes			
		become familiar with the roblems in chemistry and			istry. They are able to identify
		number of weekly conta			n)
compone • 08- • 08-	nt. 10C-1 10C-2	omprises 3 module comp -072: V (no information c -062: P (no information c -062: S (no information c	on SWS (weekly conta on SWS (weekly cont	act hours) and cours act hours) and cours	e language available)
		essment (type, scope, la on on whether module ca			tion offered — if not every seme-
	ss sta	ated otherwise, successf			e components as specified be- successful completion of all indi-
tal medici • 3 EC • writ Assessme • 4 EC	ine, e CTS, <i>I</i> tten e ent in CTS, <i>I</i>	ngineering and natural s Method of grading: nume xamination (approx. 60 module component o8- Method of grading: (not)	cience prical grade minutes) I OC-2-062: Organic (successfully complet	Chemistry Lab for eng	
test • Onl Assessme • 3 EC	tate (ly afte ent in CTS , I	post-experiment exams, r successful completion	approx. 15 minutes e of module compone I OC-3-062: Tutorial o rical grade	ach) nts: 08-IOC-1	f practical performance, Nach- istry Lab for engineering students
Allocation			<u> </u>		
Allocation	n or p	ומנכס			
	1 : 6				
Additiona	at info	prination			
Workload	1				
Teaching	cycle	2			

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

Module appears in

Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2006)

-	e title				Abbreviation
Organi	sche C	hemie für Studierende d	ler Ingenieurwissensc	haften	08-10C-062-m02
Modul	e coord	inator		Module offered by	1
		pervisor "Organisch-che le der Ingenieurwissens		Institute of Organic	Chemistry
ECTS	1	od of grading	Only after succ. con	npl. of module(s)	
10		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 on
Conten	Its				
		rovides students with a e fundamental techniqu			organic chemistry. In addition, it
Intend	ed lear	ning outcomes			
		e become familiar with t problems in chemistry a			nistry. They are able to identify
Course	s (type	, number of weekly cont	act hours, language –	- if other than Germa	an)
compo • c • c	nent. 08-10C- 08-10C-	omprises 3 module com 1-072: V (no information 2-062: P (no informatior 3-062: S (no informatior	on SWS (weekly cont on SWS (weekly cont	act hours) and cours act hours) and cours	se language available)
					ation offered — if not every seme-
		on on whether module			alon oncica in not every senie
low. Ur		ated otherwise, success			e components as specified be- successful completion of all indi-
tal med • 3 • v Assess • 4 • \ • \ • 0	dicine, 3 ECTS, vritten 4 ECTS, 4 ECTS, 7 ortesta 1 ortesta	engineering and natural Method of grading: num examination (approx. 60 n module component of Method of grading: (not te (pre-experiment exam 5 to 10 pages), Nachtes rerequisites: Registratio	science herical grade b minutes) 3-IOC-2-062: Organic () successfully comple ms, approx. 15 minute tate (post-experiment n for assessment: as s 3-IOC-3-062: Tutorial concerical grade s)	Chemistry Lab for en ted es each), assessmen exams, approx. 15 n specified. on the Organic Chem	t of practical performance (log
E • v •) •	Other p	rerequisites: Registratio	n for assessment: as s	specified.	
• 3 • v	Other p	· -		specified.	
• 3 • v • (Allocat	Other pi tion of j	blaces	n for assessment: as s	specifiea.	
• 3 • v • (Allocat	Other pi tion of j	· -	n for assessment: as s	specified.	
• 3 • v • (Allocat	Other pi tion of j	blaces		specified.	
• 3 • v • (Allocat	Other pr tion of p	blaces			
• 3 • v • (Allocat Additic	Other pr tion of p	blaces		specified.	
• 3 • v • (Allocat Additic Worklo	Other pr tion of p	ormation		specified.	
• 3 • v • (Allocat Additic Worklo	Other provide the provident of provident of provident of the provident of	ormation		specified.	
• 3 • v • C Allocat Additic Worklo Teachi	Other prision of the prision o	ormation		erated 26-Aug-2024 • exam.	reg. data record page 19 / 54

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

Module appears in

Bachelor' degree (1 major) Technology of Functional Materials (2009)

Module title				Abbreviation
Physical Cher	mistry for engineering stu	idents (lecture and la	aboratory course)	08-IPC-091-m01
Module coordinator Module offered by				
lab course supervisor "Physikalische Chemie für Studieren- Institute of Physical and Theoretical Chemistry				
	eurwissenschaften, Prakt			
	od of grading	Only after succ. com	npl. of module(s)	
	rical grade			
Duration	Module level	Other prerequisites		
1 semester	undergraduate			
Contents	• • • • • • •	·		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	provides students with an e fundamental technique			physical chemistry. In addition, it
	ning outcomes	o or physical ellemise		
		e fundamental princi	ples of physical cher	mistry. They are able to identify
	problems in chemistry an	•		
Courses (type	, number of weekly conta	ct hours, language —	· if other than Germa	n)
This module of	comprises 3 module comp	oonents. Information	on courses will be li	sted separately for each module
component.	a a Ca M . Ü (na informat	ian an CWC (weakly a		
	2-062: V + Ü (no informat 1-091: V + Ü (no informati			ourse language available) urse language available)
	3-091: P (no information of			
				tion offered — if not every seme-
•	ion on whether module c		-	
	tated otherwise, successf			e components as specified be- successful completion of all indi-
troscopy) for a gineering stud • 8 ECTS, • written Assessment i engineering s • 5 ECTS, • written Assessment i • 5 ECTS,	engineering students Phy dents Method of grading: nume examination (approx. 90 n module component o8- tudents Physical Chemist Method of grading: nume examination (approx. 90 n module component o8- Method of grading: (not)	sical Chemistry 2 (ba erical grade minutes) IPC-1-091: Physical C ry 1 (thermodynamics erical grade minutes) IPC-3-091: Physical C successfully complet	sics of quantum mee hemistry 1 (thermod s, electrochemistry) Chemistry for engined	ering students, laboratory course
testate	(post-experiment exams,			of practical performance, Nach-
Allocation of	places			
Additional inf	ormation			
Workload				
Teaching cycl	e			

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

Module appears in

Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010)

Module	e title				Abbreviation
Moder	n Analy	tical Methods (lecture ar	nd laboratory course)		08-MAM-091-m01
Module coordinator Module offered by					<u> </u>
Dean o	fStudie	es Funktionswerkstoffe (F	unctional Materials)	•	echnology of Material Synthesis
ECTS		od of grading	Only after succ. com		
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
		ciples, gravimetric methon, fluorescence, NMR etc.			opic methods (UV-VIS, IR, Ra-
Intende	ed learı	ning outcomes			
Studen	its have	e developed modern anal	ytics expertise.		
Course	s (type	, number of weekly conta	ct hours, language —	if other than Germa	n)
• c Methor ster, in Assess	8-MAN 8-MAN d of ass formati ment ir nless st	on on whether module ca n this module comprises ated otherwise, successf	n on SWS (weekly con nguage — if other tha an be chosen to earn the assessments in th	tact hours) and cou In German, examina a bonus) ne individual module	
• 3 • w Assess • 2 • V (ECTS, vritten e ment in ECTS, ortesta post-ex	periment exams, approx.	erical grade) MAM-2-091: Modern successfully complet is, approx. 15 minute	Analytics (practical ed	course) x. 5 pages each), Nachtestate
Allocat	ion of p	olaces			
Additio	onal info	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regu	lations for teaching-d	egree programmes)	
Module	e appea	irs in			
Bachel	or' deg	ree (1 major) Technology ree (1 major) Technology		-	

Module					Abbreviation
Chemic	ally ar	nd biologically inspired N	anotechnology for M	laterials Synthesis	08-NT-091-m01
Module	e coord	inator		Module offered by	<u> </u>
			logy of Material Syn-	· · · · ·	echnology of Material Synthesis
ECTS	Meth	od of grading	Only after succ. com	npl. of module(s)	
5		rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
of anal	ysis us		nerated materials. It	also discusses the fu	istry and discusses the methods undamental principles of biomi- ynthesis.
Intende	ed lear	ning outcomes			
Studen	ts have	e developed an advanced	knowledge of sol-ge	l chemistry and bior	nineralisation.
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	in)
• 0	8-NT-1 8-NT-2	-091: V (no information o -091: V (no information o	n SWS (weekly conta	ct hours) and course	e language available)
		sessment (type, scope, la ion on whether module ca			tion offered — if not every seme
	iless st	ated otherwise, successf			e components as specified be- successful completion of all ind
als Syn 2 0 Assess thesis 3	thesis ECTS, ral exa ment i ECTS,	Method of grading: nume mination (approx. 15 min	erical grade utes) NT-2-091: From Biom erical grade		pired Nanotechnology for Mate ogically inspired Materials Syn-
Allocat	ion of _l	places			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	d to in	LPOI (examination regu	lations for teaching-o	degree programmes)	
Module	e appea	ars in			
		ars in ree (1 major) Technology	of Functional Materia	als (2009)	

Module title				Abbreviation
Programmin	g course for Chemistry Ma	ijors		08-PKC-092-m01
Module coor	dinator		Module offered by	
	cture "Programmierkurs fü	r Chemiker"		l and Theoretical Chemistry
	nod of grading	Only after succ. con		
5 (not)	successfully completed			
Duration	Module level	Other prerequisites		
1 semester	undergraduate			
Contents				
	provides an introduction t ed to problems in chemist		of a programming lar	nguage and discusses how they
Intended lea	rning outcomes			
Students are chemistry.	able to describe the fund	amentals of the prog	ramming language a	nd to apply them to problems in
Courses (typ	e, number of weekly conta	ct hours, language –	- if other than Germa	n)
V + Ü (no inf	ormation on SWS (weekly	contact hours) and co	ourse language avail	able)
	ssessment (type, scope, la tion on whether module ca			tion offered — if not every seme-
	mination: completion of p time as specified at the be			on of algorithms used (length/ex-
Allocation of	places			
Additional in	formation	·		
Workload				
Teaching cyo	le			
Referred to i	n LPO I (examination regu	lations for teaching-o	degree programmes)	
	,			
Module appe	ears in			
	gree (1 major) Chemistry (2	2009)		
	gree (1 major) Technology		als (2009)	
Bachelor' de	gree (1 major) Technology	of Functional Materia	als (2010)	

Module	e title				Abbreviation	
Data ba	ises				10-I-DB-072-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studie	es Informatik (Computer S	Science)	Institute of Computer Science		
ECTS		od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio		Module level	Other prerequisites			
1 seme	ster	undergraduate	-			
Conten	ts					
	-	ebra and complex SQL st gement.	atements; database p	planning and normal	forms; xml data modelling; tran-	
Intende	ed learı	ning outcomes				
		oossess a knowledge abo g in XML.	out database modelli	ng and queries in SC	L, transactions as well as easy	
Course	s (type	, number of weekly conta	ct hours, language —	if other than Germa	n)	
		mation on SWS (weekly o				
Method	d of ass		nguage — if other tha	an German, examina	tion offered — if not every seme-	
					inutes, groups of 2: 20 minutes,	
		5 minutes)			mutes, groups of 2. 20 minutes,	
Allocat		-				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	9				
Referre	d to in	LPOI (examination regu	lations for teaching-d	legree programmes)		
			0			
Module	e appea	irs in				
Bachel	or' deg	ree (1 major) Computer S	cience (2007)			
Bachel	or' deg	ree (1 major) Mathematic	s (2008)			
	-	ree (1 major) Mathematic				
		ree (1 major) Technology				
	-	ree (1 major) Technology				
	-	ree (1 major) Business Int	•			
	-	ree (1 major) Business Int	-	-		
	-	ree (1 major) Business Int	•			
		ree (1 major) Computation				
Bachel	or' deg	ree (1 major) Technology	of Functional Materia	IS (2006)		

Module	title				Abbreviation
Introdu	iction t	o computer science of all	faculties		10-I-EPIN-062-m01
Module	Module coordinator Module offered by				
		es Informatik (Computer S	Science)	Institute of Comput	er Science
ECTS		od of grading	Only after succ. com		
5		rical grade		1	
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Repres	entatio	n of information and web	sites (HTML, XML, El	BNF), databases, pro	ogramming (Java).
Intende	ed lear	ning outcomes			
		possess a basic knowled s and programming in Jav		ntation of informatio	on and websites (HTML, XML, EB-
Course	s (type	, number of weekly conta	ct hours, language —	if other than Germa	in)
V + Ü (r	no infoi	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		sessment (type, scope, la ion on whether module ca			tion offered — if not every seme-
		nation (50 minutes) or ora 5 minutes)	al examination (one o	andidate each: 20 r	ninutes, groups of 2: 25 minutes,
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	d to in	LPOI (examination regu	lations for teaching-o	legree programmes)	
Module	e appea	ars in			
Bachel	Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Technology of Functional Materials (2006)				

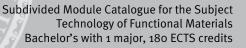
Module title				Abbreviation	
Computeror	iented Mathematics			10-M-COM-082-mo	1
Module coo			Module offered by		
	dies Mathematik (Mather	matics) Institute of Mathematics			
	hod of grading	Only after succ. con	npl. of module(s)		
-) successfully completed	-			
Duration	Module level	Other prerequisites			
1 semester	undergraduate		site to assessment: red, a maximum of o	-	
Contents					
merical com 10-M-ANL) a	to modern mathematica putation (e.g. Matlab) to nd 10-M-LNA). Computer al and integral calculus;	supplement the basic based solution of prob	modules in analysis plems in linear algeb	and linear algebra (((10-M-ANA or
Intended lea	arning outcomes				
	learns the use of advanc lication to solve mathem		cal software package	es, and is able to ass	sess their
Courses (typ	e, number of weekly con	tact hours, language –	- if other than Germa	n)	
V + Ü (no inf	ormation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
ster, informa project in th Assessment	ssessment (type, scope, ation on whether module e form of programming e offered: once a year, sur assessment: German, Er	can be chosen to earn xercises (as specified a nmer semester	a bonus) at the beginning of th		every seme-
Allocation o		<u></u>			
	i piùces				
Additional i	- for man of the m				
Additional	mormation				
Workload					
Teaching cy	cle				
Referred to	in LPO I (examination reg	gulations for teaching-	degree programmes)		
§ 73 (1) 5. M	athematik Angewandte N	Nathematik			
Module app	ears in				
	egree (1 major) Computer	Science (2010)			
	gree (1 major) Mathemat				
Bachelor' de	egree (1 major) Physics (2	010)			
	egree (1 major) Physics (2	-			
	egree (1 major) Physics (2				
	egree (1 major) Physics (2				
	egree (1 major) Technolog		-		
	egree (1 major) Technolog egree (1 major) Nanostruc	-			
	egree (1 major) Kanoshuc egree (1 major) Economat)		
	egree (1 major) Economat	-			
	najor Technology of Functional	JMU Würzburg • gen	erated 26-Aug-2024 • exam. Technologie der Funktionsw	-	page 28 / 54

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Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Master's degree (1 major) Physics (2010) 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) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

Module	e title				Abbreviation	
Introdu	uction t	o Functional Analysis			10-M-FAN-072-m01	
Module	e coord	inator		Module offered by	<u> </u>	
Dean o	of Studio	es Mathematik (Mathem	k (Mathematics) Institute of Mathematics			
ECTS	-	od of grading	Only after succ. con			
5	-	rical grade				
Duratio		Module level	Other prerequisites			
1 seme		undergraduate		s must be met to qu	alify for admission to	o as-
		-	sessment. The lectu	rer will inform stude	nts about the respec	ctive details
			at the beginning of	the course. Registrat	ion for the course wi	ill be con-
			sidered a declaratio	n of will to seek adm	nission to assessme	nt. If stu-
			dents have obtained	d the qualification fo	r admission to asse	ssment over
			the course of the se	mester, the lecturer	will put their registra	ation for as-
			sessment into effect	t. Students who mee	t all prerequisites w	ill be admit-
				n the current or in th		
				date, students will h	ave to obtain the qu	alification for
			admission to assess	sment anew.		
Conten						
		s and Hilbert spaces, bo	ounded operators, prin	nciples of functional	analysis.	
Intende	ed lear	ning outcomes	_			
		nows the fundamental c				
		ole to apply methods fro bility of the theory to oth			al analysis, and reali	ses the
		, number of weekly cont				
		mation on SWS (weekly				
		s essment (type, scope, l on on whether module o			tion offered — if not	every seme-
		nation (approx. 90 minu		- -	ten examination car	he replaced
		mination of one candida				
2, appr	rox. 30	minutes)			5 .	
		ssessment: German, En	glish if agreed upon w	vith the examiner		
Allocat	tion of p	olaces				
Additio	onal inf	ormation	_			
			_			
Worklo	bad					
Teachi	ng cycl	٩				
			_			
Referre	ed to in	LPOI (examination reg	ulations for teaching-	degree programmes)		
		hematik Analysis	3			
	e appea	*				
Bachel	or' deg	ree (1 major) Mathemati	cs (2008)			
	-	ree (1 major) Mathemati				
	-	ree (1 major) Technology		-		
Bachel	or' deg	ree (1 major) Technology	of Functional Materia	als (2010)		
Bachelor's Materials (:		or Technology of Functional		erated 26-Aug-2024 • exam. Technologie der Funktionsw	-	page 30 / 54
((0		

Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) 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) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009) Bachelor' degree (1 major) Technology of Functional Materials (2006)

Module title				Abbreviation		
Numerical Ma	thematics 1			10-M-NM1-082-m01	1	
Module coord	inator		Module offered by	·		
Dean of Studi	es Mathematik (Mathem	natics)	atics) Institute of Mathematics			
ECTS Methe	od of grading	Only after succ. con	npl. of module(s)			
8 nume	rical grade					
Duration 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 fo admission to assessment anew.				
Contents						
Solution of sy	stems of linear equatior tion with polynomials, s	• •	-		s of equati-	
Intended lear	ning outcomes					
	acquainted with the fu oblems and knows about			erical mathematics, a	applies them	
Courses (type	, number of weekly cont	act hours, language –	- if other than Germa	ın)		
V + Ü (no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)		
	sessment (type, scope, l ion on whether module			tion offered — if not	every seme-	
by an oral exa 2, approx. 30	nation (approx. 90 minu mination of one candida minutes) ssessment: German, En	ate each (approx. 20 n	ninutes) or an oral ex			
Allocation of		<u> </u>				
Additional inf	ormation					
Workload						
Teaching cycl	ρ					
	~					
Referred to in	LPOI (examination reg	ulations for teaching	degree programmos			
	hematik Angewandte M		acsiec programmes)			
Module appea						
Bachelor' deg Bachelor' deg Bachelor' deg Bachelor' deg	ree (1 major) Computer 5 ree (1 major) Mathemati ree (1 major) Physics (20 ree (1 major) Physics (20	cs (2008) 010) 009)				
Bachelor's with 1 ma Materials (2009)	jor Technology of Functional		erated 26-Aug-2024 • exam. Technologie der Funktionsw	_	page 32 / 54	

UNIVERSITÄT WÜRZBURG

Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Physics (2008) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) 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) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Functional Materials (2012) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

Module	e title				Abbreviation			
Numeri	cal Ma	thematics 2			10-M-NM2-082-mo	1		
Module coordinator				Module offered by	<u> </u>			
Dean o	Dean of Studies Mathematik (Mathematics) Institute of Mathematics							
ECTS		od of grading	Only after succ. con					
5	nume	rical grade		- · · ·				
Duratio	n	Module level	/el 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			admission to asses	Sment dilew.				
Solutio nary dif Intende	n meth fferenti ed learr	ods and applications fo al equations, boundary ning outcomes	value problems.					
about t and eng	heir ad gineeri	able to draw a distincti vantages and limitatior ng sciences and econor	ns concerning the poss nics.	sibilities of application	on in different fields			
		number of weekly cont						
		mation on SWS (weekly						
		essment (type, scope, on on whether module			tion offered — if not	every seme-		
by an o 2, appr	ral exa ox. 30 i	nation (approx. 90 minu mination of one candid minutes) ssessment: German, En	ate each (approx. 20 r	ninutes) or an oral ex				
Allocat	-		<u> </u>					
Additio	nal info	ormation						
 Worklo	ad							
Teachir	ng cycl	9						
Referre	d to in	LPOI (examination reg	ulations for teaching-	degree programmes)				
§ 73 (1)	5. Mat	hematik Angewandte M	lathematik					
Module	e appea	rs in						
Bachel	or' deg	ree (1 major) Mathemat ree (1 major) Physics (2 ree (1 major) Physics (2	010)					
Bachelor's Materials (2		or Technology of Functional		erated 26-Aug-2024 • exam.) Technologie der Funktionsw	-	page 34 / 54		

UNIVERSITÄT WÜRZBURG

Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Physics (2008) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) 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) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Functional Materials (2012) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

Dean of Studies Mathematik (Mathematics) Ins ECTS Method of grading Only after succ. compl. 5 numerical grade Duration Module level Other prerequisites 1 semester undergraduate Certain prerequisites m sessment. The lecture restriction	10-M-ODE-082-m01 odule offered by stitute of Mathematics of module(s)
Dean of Studies Mathematik (Mathematics) Ins ECTS Method of grading Only after succ. compl. 5 numerical grade Duration Module level Other prerequisites 1 semester undergraduate Certain prerequisites m sessment. The lecture m	stitute of Mathematics
Dean of Studies Mathematik (Mathematics) Ins ECTS Method of grading Only after succ. compl. 5 numerical grade Duration Module level Other prerequisites 1 semester undergraduate Certain prerequisites m sessment. The lecture m	stitute of Mathematics
ECTS Method of grading Only after succ. compl. 5 numerical grade Duration Module level Other prerequisites 1 semester undergraduate Certain prerequisites m sessment. The lecturer	
5 numerical grade Duration Module level Other prerequisites 1 semester undergraduate Certain prerequisites m sessment. The lecturer	
DurationModule levelOther prerequisites1 semesterundergraduateCertain prerequisites m sessment. The lecturer	
1 semester undergraduate Certain prerequisites m sessment. The lecturer	
dents have obtained the the course of the semes sessment into effect. St ted to assessment in th	ust be met to qualify for admission to as- will inform students about the respective details course. Registration for the course will be con- f will to seek admission to assessment. If stu- e qualification for admission to assessment over ster, the lecturer will put their registration for as- tudents who meet all prerequisites will be admit- be current or in the subsequent semester. For as- e, students will have to obtain the qualification for
admission to assessme	
Contents	
Existence and uniqueness theorem; continuous dependence of ferential equations; matrix exponential series; linear differentia	
Intended learning outcomes	,
The student is acquainted with the fundamental concepts and requations. He/she is able to apply these methods to practical p	
Courses (type, number of weekly contact hours, language — if c	
V + Ü (no information on SWS (weekly contact hours) and cours	
Method of assessment (type, scope, language — if other than G ster, information on whether module can be chosen to earn a b	German, examination offered — if not every seme-
written examination (approx. 90 minutes); if announced by the by an oral examination of one candidate each (approx. 20 minu 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with	utes) or an oral examination in groups (groups of
Allocation of places	
Additional information	
Workload	
Teaching cycle	
Referred to in LPO I (examination regulations for teaching-degree programmes)	
Module appears in	
Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Physics (2008)	
Bachelor' degree (1 major) Technology of Functional Materials ((2009)

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) 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) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) Bachelor' degree (1 major) Technology of Functional Materials (2006)

Module title				Abbreviation
Programming	course for students of	Mathematics and othe	er subjects	10-M-PRG-082-m01
Module coordinator			Module offered by	7
Dean of Stud	ies Mathematik (Mather	natics)	Institute of Mathe	
	od of grading	Only after succ. cor		
	successfully completed			
Duration	Module level	Other prerequisites	•	
1 semester	undergraduate	1		regular attendance (attendance
I Semester				of unexcused absence).
Cantanta		Information cu, u maxim		or unexcused absence).
Contents		·	<u> </u>	
Basics of a m matics.	odern programming lan	guage (e. g. C or Fortra	in) taking into accou	int the particular needs in mathe-
Intended lear	ning outcomes			
The student i	s able to work independ	ently on small prograr	nming exercises and	d standard programming problem
in mathemati	CS.			
Courses (type	e, number of weekly con	tact hours, language -	– if other than Germ	an)
P (no informa	tion on SWS (weekly co	ntact hours) and cours	se language availabl	le)
	sessment (type, scope, ion on whether module			ation offered — if not every seme-
	form of programming e			the course)
	assessment: German, Ei			
Allocation of		<u> </u>		
	places			
Additional in				
Additional in	formation			
Workload				
Teaching cyc	le			
Referred to ir	LPOI (examination reg	gulations for teaching-	degree programmes	5)
§ 73 (1) 5. Ma	thematik Angewandte N	lathematik		
Module appe	<u>,</u>			
	gree (1 major) Mathemat	ics (2008)		
	gree (1 major) Physics (2			
-	gree (1 major) Physics (2			
-	gree (1 major) Physics (2	-		
	gree (1 major) Physics (2			
-	gree (1 major) Technolog		als (2000)	
-	gree (1 major) Technolog	•	-	
	gree (1 major) Nanostruc	•		
	gree (1 major) Economat		· /	
-	gree (1 major) Economat	-		
	gree (1 major) Mathemat			
	gree (1 major) Computat		009)	
	ree (1 major) Physics (20			
-	ree (1 major) Technology		lls (2010)	
-	ree (1 major) Technology			
	ajor Technology of Functional		nerated 26-Aug-2024 • exam	n. reg. data record page 38 / 54
Aaterials (2009)) Technologie der Funktions	



Master's degree (1 major) Functional Materials (2012) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

Module	Module title Abbreviation					
Mathe	matics	1 for students of Technol	ogy of Functional Ma	terials	10-M-TFU1-091-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mather	natics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	Its					
		on numbers and functio aces, simple differential		eries, differential ar	id integral calculus in one varia-	
Intend	ed lear	ning outcomes				
to simp	ole prot				he learns to apply these methods hnology of functional materials,	
Course	s (type	, number of weekly conta	ct hours, language —	if other than Germa	an)	
V + Ü (I	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avai	lable)	
		essment (type, scope, la on on whether module c			ation offered — if not every seme-	
written	exami	nation (approx. 90 minut	es)			
Allocat	ion of p	olaces				
Additio	onal inf	ormation	·			
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regu	lations for teaching-o	legree programmes)	
Module	e appea	urs in				
Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010)						

Module title Abbreviation					
Mathematics 2 for students of Technology of Functional Materials					
Module coordinator Module				Module offered b	by
Dean c	of Studi	es Mathematik (Mathen	natics)	Institute of Math	ematics
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade			
Duratio	on	Module level	Other prerequisites	i	
1 seme	ester	undergraduate			
Conter	nts				
		and systems of linear eq variables, differential eq			ory, differential and integral calcu-
Intend	ed lear	ning outcomes			
se met	hods to		d engineering science		natics. He/She learns to apply the- the technology of functional materi
Course	s (type	, number of weekly cont	act hours, language –	- if other than Ger	man)
Ü + V (no info	rmation on SWS (weekly	contact hours) and co	ourse language av	ailable)
		s essment (type, scope, ion on whether module			ination offered — if not every seme-
written	exami	nation (approx. 90 minu	tes)		
Allocat	tion of	places			
Additio	onal inf	ormation			
Worklo	ad		_		
Toochi					
reach	ng cycl	e			
 Defer				d	
Keterre	ea to in	LPOI (examination reg	ulations for teaching-	uegree programm	esj
		•			
	e appea				
Bachel	or' deg	ree (1 major) Technolog	y of Functional Materia	als (2009)	

Module	e title				Abbreviation
Introdu	uction t	o Physics Part 1 for stud	11-ENNF1-062-m01		
M - J - J		•		Mandala affanad baa	<u> </u>
Module				Module offered by	
	<u> </u>	ector of the Institute of A		Faculty of Physics a	and Astronomy
ECTS		od of grading rical grade	Only after succ. con	npl. of module(s)	
7		-			
Duration		Module level undergraduate	Other prerequisites		
		undergraduate			
Conten	-				
		bration theory, thermody	mamics.		
Intende	ed lear	ning outcomes			
The stu	udents	nave basic knowledge of	physics for engineer	ing students.	
Course	s (type	, number of weekly conta	act hours, language –	- if other than Germa	in)
V + Ü (ı	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avail	able)
Metho	d of ass	essment (type, scope, la	anguage — if other th	an German, examina	tion offered — if not every seme-
		on on whether module c			
written	exami	nation (approx. 120 minu	ites)		
Allocat	tion of p	olaces			
Only as	s part o	f pool of general key skil	ls (ASQ): 20 places. F	laces will be allocat	ed by lot.
		ormation			
Worklo	ad				
Workto					
Toochi		•			
Teachi	ing cyci	e			
Reterre					
Referre		LPO I (examination regu	lations for teaching-	degree programmes)	
			lations for teaching-	degree programmes)	
 Module			llations for teaching-o	degree programmes)	
 Module Bachel	e appea lor' deg	n rs in ree (1 major) Mathematio	cs (2008)	degree programmes)	
 Module Bachel Bachel	e appea or' deg or' deg	n rs in ree (1 major) Mathematic ree (1 major) Mathematic	cs (2008) cs (2014)	degree programmes)	
 Module Bachel Bachel Bachel	e appea or' deg or' deg or' deg	r es in ree (1 major) Mathematic ree (1 major) Mathematic ree (1 major) Mathematic	cs (2008) cs (2014) cs (2012)	degree programmes)	
 Module Bachel Bachel Bachel Bachel	e appea or' deg or' deg or' deg or' deg	r rs in ree (1 major) Mathematic ree (1 major) Mathematic ree (1 major) Mathematic ree (1 major) Mathematic	25 (2008) 25 (2014) 25 (2012) 25 (2013)	degree programmes)	
 Module Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg or' deg or' deg or' deg	r es in ree (1 major) Mathematic ree (1 major) Mathematic ree (1 major) Mathematic ree (1 major) Mathematic ree (1 major) Mathematic	zs (2008) zs (2014) zs (2012) zs (2013) zs (2007)		
 Module Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg or' deg or' deg or' deg or' deg	ree (1 major) Mathematic ree (1 major) Technology	es (2008) es (2014) es (2012) es (2013) es (2007) of Functional Materia	als (2009)	
 Module Bachel Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg or' deg or' deg or' deg or' deg or' deg	rrs in ree (1 major) Mathematic ree (1 major) Technology ree (1 major) Technology	25 (2008) 25 (2014) 25 (2012) 25 (2013) 25 (2007) 26 Functional Materia 26 Functional Materia	als (2009) als (2010)	
 Module Bachel Bachel Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg or' deg or' deg or' deg or' deg or' deg or' deg	ree (1 major) Mathematic ree (1 major) Technology ree (1 major) Technology ree (1 major) Computatio	25 (2008) 25 (2014) 25 (2012) 25 (2013) 25 (2007) of Functional Materia of Functional Materia nal Mathematics (20	als (2009) als (2010) 09)	
 Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg or' deg or' deg or' deg or' deg or' deg or' deg or' deg	ree (1 major) Mathematic ree (1 major) Technology ree (1 major) Technology ree (1 major) Computatio ree (1 major) Computatio	es (2008) es (2014) es (2012) es (2013) es (2007) of Functional Materia nal Mathematics (20 nal Mathematics (20	als (2009) als (2010) 09) 14)	
 Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg or' deg or' deg or' deg or' deg or' deg or' deg or' deg or' deg	ree (1 major) Mathematic ree (1 major) Technology ree (1 major) Technology ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Computatio	es (2008) (2014) (2012) (2013) (2013) (2013) (2007) (2007) of Functional Materia (2007) of Functional Materia (2007) (200	als (2009) als (2010) 09) 14) 12)	
 Module Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg	ree (1 major) Mathematic ree (1 major) Technology ree (1 major) Technology ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Computatio	es (2008) es (2014) es (2012) es (2013) of Functional Materia of Functional Materia nal Mathematics (20 nal Mathematics (20 nal Mathematics (20 nal Mathematics (20 nal Mathematics (20	als (2009) als (2010) 09) 14) 12) 13)	
 Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg	ree (1 major) Mathematic ree (1 major) Technology ree (1 major) Technology ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Aerospace (1	es (2008) (2014) (2012) (2013) (2013) (2007)	als (2009) als (2010) 09) 14) 12) 13) 009)	
 Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg	ree (1 major) Mathematic ree (1 major) Technology ree (1 major) Technology ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Aerospace (1 ree (1 major) Aerospace (1	es (2008) (2014) (2012) (2013) (2013) (2013) (2007)	als (2009) als (2010) 09) 14) 12) 13) 009) 014)	
 Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg	ree (1 major) Mathematic ree (1 major) Technology ree (1 major) Technology ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Aerospace (1 ree (1 major) Aerospace (1 ree (1 major) Aerospace (1	es (2008) (2014) (2012) (2013)	als (2009) als (2010) 09) 14) 12) 13) 009) 014)	
 Module Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel Bachel	e appea or' deg or' deg	ree (1 major) Mathematic ree (1 major) Technology ree (1 major) Technology ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Computatio ree (1 major) Aerospace (1 ree (1 major) Aerospace (1	es (2008) (2014) (2012) (2012) (2013) (2013) (2007)	als (2009) als (2010) 09) 14) 12) 13) 009) 014) 011)	

Module	e title				Abbreviation
Introduction to Physics Part 2 for students of Physics Related Minor Subjects					11-ENNF2-062-m01
Module coordinator				Module offered by	<u> </u>
		ector of the Institute of Ap	onlied Physics	Faculty of Physics a	and Astronomy
ECTS		od of grading	Only after succ. com		
7		rical grade			
Duratio		Module level	Other prerequisites		
1 seme	ester	undergraduate			
Conten	nts				
Science	e of ele	ctricity, magnetism, optio	cs, Atomic Physics.		
		ning outcomes			
		have basic knowledge of	physics for engineeri	ng students.	
		, number of weekly conta	–		n)
		mation on SWS (weekly o			
					ition offered — if not every seme-
		on on whether module c			
written	exami	nation (approx. 120 minu	tes)		
Allocat	tion of p	olaces			
Only as	s part o	f pool of general key skill	s (ASQ): 20 places. P	laces will be allocat	ed by lot.
Additio	onal inf	ormation	· · ·		
	_				
Worklo	ad				
Teachi	ng cycl	e			
		•			
Roforro	ad to in	LPOI (examination regu	lations for teaching.	legree programmes)	
Kerente					
Modula	e appea	ors in			
		ree (1 major) Mathematic	s (2008)		
	-	ree (1 major) Mathematic			
	-	ree (1 major) Mathematic			
	-	ree (1 major) Mathematic			
		ree (1 major) Mathematic			
Bachel	or' deg	ree (1 major) Technology	of Functional Materia	lls (2009)	
Bachel	or' deg	ree (1 major) Technology	of Functional Materia	lls (2010)	
Bachel	or' deg	ree (1 major) Computatio	nal Mathematics (200	09)	
	-	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			
D 1 1	Bachelor' degree (1 major) Technology of Functional Materials (2006)				

Module title Abbreviation						
Mather	Mathematics 3 for students of Physics and Engineering 11-MPI3-062-m01					
AA - J.J.				Mandala affanad haa		
Module				Module offered by		
Managi and Ast		ector of the Institute of T ics	heoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semester undergraduate		Admission prerequisite to assessment: successful completion of approx. 50% of exercises. 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				
			for admission to as	er date, students wil sessment anew.	t have to obtain the	qualification
Conten	ts					
Ordinar	ry and p	partial differential equat	ions in Physics.			
Intende	ed learı	ning outcomes				
		nave basic mathematica ntial equations.	l knowledge of dynan	nic equations and so	lution methods for c	common and
Course	s (type	, number of weekly cont	act hours, language –	- if other than Germa	ın)	
		mation on SWS (weekly				
		essment (type, scope, l on on whether module o			ition offered — if not	every seme-
written	exami	nation (approx. 120 min	utes)			
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir	וס cvcl	2				
reaciiii	-5 cycl	•				
 Deferm	d # = !=		ulations for to a lite			
Kererre	a to in	LPOI (examination reg	utations for teaching-	uegree programmes)		
		_				
Module						
Bachelo Bachelo Bachelo	or' deg or' deg or' deg	ree (1 major) Physics (20 ree (1 major) Physics (20 ree (1 major) Physics (20 ree (1 major) Technology	009) 008) v of Functional Materia	-		
	-	ree (1 major) Technology ree (1 major) Nanostruct				
Bachelor's Materials (2		or Technology of Functional		erated 26-Aug-2024 • exam. Technologie der Funktionsw	-	page 44 / 54

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Bachelor' degree (1 major) Nanostructure Technology (2012) 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 title Abbreviation					Abbreviation
Basics of NanostructureTechnology					11-N1-072-m01
Module	coordinator			Module offered by	
Managi	ng Director of the	Institute of Ap	plied Physics	Faculty of Physics a	nd Astronomy
ECTS	Method of gradin	ng	Only after succ. com	pl. of module(s)	
6	numerical grade				
Duratio	n Module le	vel	Other prerequisites		
1 seme	ster undergrad	luate			
Conten	ts				
Princip	les of producing, o	characterising	and applying nanost	ructures.	
Intende	ed learning outcor	mes			
	dents have knowl nanostructures.	ledge of the fu	ndamental properties	s, technologies, chai	racterising methods and functi-
Course	s (type, number of	f weekly conta	ct hours, language —	if other than Germa	n)
V + S (n	o information on	SWS (weekly o	contact hours) and co	urse language availa	able)
ster, inf		ther module ca	an be chosen to earn		tion offered — if not every seme-
	· ·	10x. 90 mmut	= 5)		
Allocal	ion of places				
Additio	nal information				
Worklo	ad				
Teachir	ng cycle				
Referre	d to in LPO I (exa	mination regu	lations for teaching-c	legree programmes)	
Module	appears in				
Bachelo	or' degree (1 majo	r) Physics (20	08)		
	• • •		of Functional Materia		
	• • •		of Functional Materia		
			re Technology (2008		
			re Technology (2007))	
			ysics (Minor, 2008)		
васпею	Bachelor' degree (1 major) Technology of Functional Materials (2006)				

Module	e title				Abbreviation
Physic	s Labor	atory Course for student	s of Physics Related	Minor Subjects	11-PNNF-062-m01
Module	e coord	inator		Module offered by	<u> </u>
		ector of the Institute of Ap	onlied Physics	Faculty of Physics a	and Astronomy
ECTS		od of grading	Only after succ. com		
3		successfully completed		<u> </u>	
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Mecha Physics		bration theory, thermody	namics, optics, X-ray	s, nuclear magnetic	resonance, Atomic and Nuclear
Intende	ed learı	ning outcomes			
The stu	dents l	know the principles of Ph	ysics.		
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	an)
P (no ir	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)
		· · · · ·			ition offered — if not every seme-
		on on whether module ca			
a) oral	test (ap	prox. 15 minutes) during	experiment and b) u	ngraded written exa	mination (approx. 90 minutes)
Allocat	ion of p	olaces			
Only as	s part o	f pool of general key skill	s (ASQ): 15 places. P	laces will be allocate	ed by lot.
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cvcl	6			
	3 0 0 0	-			
Referre	d to in	LPO I (examination regu	lations for teaching-	legree programmes)	
Module		ors in			
		ree (1 major) Mathematic	s (2008)		
	-	ree (1 major) Mathematic			
	-	ree (1 major) Mathematic			
	-	ree (1 major) Mathematic			
	-	ree (1 major) Mathematic			
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		13)	
	-	ree (1 major) Functional N			
Dachel	u aeg	ree (1 major) Technology	or runctional Materia	us (2006)	

Module title					Abbreviation	
Laboratory course on Physical Technology of Material Synthesis 11-PPT-091-m01						
Module coordinator Modul			Module offered by			
Manag	ing Dir	ector of the Institute of Ap	plied Physics	Faculty of Physics a	and Astronomy	
ECTS		od of grading	Only after succ. con	npl. of module(s)		
5	(not)	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	undergraduate				
Conten	nts					
Growth	and co	pating procedures, metho	ds of characterisatio	n and exemplary str	ucturing technologies.	
Intend	ed lear	ning outcomes				
The stu terial s			actical basics of mat	erial characterisatio	n and physical technology for ma-	
Course	e s (type	, number of weekly conta	ct hours, language –	- if other than Germa	an)	
P (no ir	nforma	tion on SWS (weekly cont	act hours) and cours	e language available	e)	
		sessment (type, scope, la ion on whether module ca			ation offered — if not every seme-	
nutes) cessful compo ents of consid	prior to lly com nent of the as ered su	o the experiment is passe pleted if a Testat (exam) i the assessment (a and b sessment have been succ accessfully completed.	d. b) Performing and s passed. An experir) can be repeated or	evaluating the expe nent log (approx. 8 p ice in the respective	Il test (duration: approx. 15 mi- eriment will be considered suc- bages) is to be prepared. Each semester. Only if both compon- er will the module component be	
Allocat	tion of	places				
Additio	onal inf	ormation				
Worklo	pad					
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	ars in				
	Bachelor' degree (1 major) Technology of Functional Materials (2009)					
Bachel	Bachelor' degree (1 major) Technology of Functional Materials (2010)					

Modul	e title				Abbreviation
Physical Technology of Material Synthesis. Lecture, exercises					
Modul	e coord	inator	Module offered by	<u>I</u>	
Manag	ing Dire	ector of the Institute	of Applied Physics	Faculty of Physics a	and Astronomy
ECTS		od of grading	Only after succ. cor	npl. of module(s)	
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites	5	
1 seme	ester	undergraduate			
Conter	nts				
			s of semiconductor proce rowth and coating proced		ctrics, metals and oxides. Prin-
Intend	ed lear	ning outcomes			
The stu thesis	udents	have knowledge of t	ne theoretical and practic	al principles of phys	ical technology for material syn-
Course	es (type	, number of weekly c	ontact hours, language –	– if other than Germa	in)
V + Ü (no info	rmation on SWS (wee	ekly contact hours) and c	ourse language avail	able)
			be, language — if other th ule can be chosen to earn		ition offered — if not every seme-
written	exami	nation (approx. 120 I	ninutes)		
Allocat	tion of	olaces			
Additio	onal inf	ormation			
Worklo	bad				
Teachi	ng cycl	e			
	<u> </u>				
Referre	ed to in	LPO I (examination	regulations for teaching-	degree programmes	
				0.11 1.23.4.1.100)	
Modul	e appea	ars in			

Module	Module title Abbreviation					
Comput	Computer-based Construction and Assembly (CAD/CAM) 99-CA-091-m01					
Module	Module coordinator Module offered by					
		iculty of Mechanical Engi lied Sciences Würzburg-S		University of Applie furt (FHWS)	ed Sciences Würzburg- Schwein-	
ECTS		od of grading	Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	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 yping and product validation.	
Courses	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	in)	
		mation on SWS (weekly o				
		essment (type, scope, la on on whether module ca			tion offered — if not every seme-	
written	examiı	nation (90 minutes)				
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	e				
	-					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	irs in				
Bachelo	Module appears in Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010)					

Module title Abbreviation					
Basics of Electronics 1					99-EL1-091-m01
Module coordinator				Module offered by	
				University of Applie	d Sciences Würzburg- Schwein-
		Sciences Würzburg-Schwo		furt (FHWS)	
ECTS		od of grading	Only after succ. con	npl. of module(s)	
5		rical grade			
Duratio		Module level	Other prerequisites		
1 seme	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 leari	ning outcomes	,		
		nave basic knowledge of semiconductors.	theoretical and pract	ical science of electi	ricity, especially of passive linear
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	n)
V + Ü (r	io infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		s essment (type, scope, la on on whether module ca			tion offered — if not every seme-
written	examiı	nation (60 minutes)			
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			
	<u> </u>				
Referre	d to in	LPO I (examination regu	lations for teaching-o	degree programmes)	
Module	appea	urs in			
		ree (1 major) Technology	of Functional Materia	als (2009)	
Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010)					

Module	Module title Abbreviation						
Basics	of Elec	tronics 2			99-EL2-091-m01		
Module	coord	inator		Module offered by			
				University of Applied Sciences Würzburg- Schwein-			
· ·	·	Sciences Würzburg-Schwo	furt (FHWS)				
ECTS		od of grading	Only after succ. compl. of module(s)				
5		rical grade					
Duration		Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
Theoretical and practical principles of the components of electrical engineering, basic circuits, basic elements of digital technology, combinatorial circuits and sequential circuits.							
Intende	ed leari	ning outcomes					
The students have theoretical and practical knowledge of the components of electrical engineering, basic cir- cuits, basic elements of digital technology, combinatorial circuits and sequential circuits.							
Course	s (type	, number of weekly conta	ct hours, language —	if other than Germa	n)		
V + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every seme- ster, information on whether module can be chosen to earn a bonus)							
written examination (60 minutes)							
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010)							

Module	e title				Abbreviation		
Laboratory Course on Engineering (mechanical and electrical engineering)99-IP-091-m01							
Module	e coord	inator		Module offered by			
chanica	al Engir	aculties of Electrical Eng neering at the University of weinfurt	0	University of Applied Sciences Würzburg- Schwein- furt (FHWS)			
ECTS Method of grading		Only after succ. con	ompl. of module(s)				
6	(not) s	successfully completed					
Duratio	Duration Module level		Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
Engine	ering la	boratory and internship	experiments.				
Intende	ed learı	ning outcomes					
The students have practical experiences in applying engineering methods in electrical and mechanical enginee- ring.							
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germ	an)		
P (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language availabl	le)		
		e ssment (type, scope, la on on whether module ca			ation offered — if not every seme-		
		ort / fieldwork report / re cal course (approx. 15 to		ining / report on pra	actical course / project report / re-		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
Bachelor' degree (1 major) Technology of Functional Materials (2009)							
Bachelor' degree (1 major) Technology of Functional Materials (2010)							

Module	Module title Abbreviation						
Fundamentals of Engineering Mechanics 99-TM-062-m01							
Module	e coord	inator		Module offered by			
Dean of the Faculty of Mechanical Engineering at the University of Applied Sciences Würzburg-Schweinfurt				University of Applied Sciences Würzburg- Schwein- furt (FHWS)			
ECTS	<u> </u>	od of grading	Only after succ. cor				
5		rical grade		ny arter succ. compt. of module(s)			
Duration Module level		Other prerequisites					
1 semester undergraduate							
Conten	ts						
Basics of statistics, strength of materials and dynamics.							
Intende	ed lear	ning outcomes					
		have methodological con ormations and in dimens		ining forces and stre	ess resultants, in calculating ten-		
Course	s (type	, number of weekly conta	ct hours, language –	– if other than Germa	ın)		
V + Ü (r	no info	rmation on SWS (weekly	contact hours) and c	ourse language avail	able)		
		sessment (type, scope, la ion on whether module ca			tion offered — if not every seme-		
written	exami	nation (90 minutes)					
Allocat	ion of _l	places					
Additio	nal inf	ormation					
Worklo	ad						
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Technology of Functional Materials (2006)							