

## Module Catalogue

for the Subject

## Nanostructure Technology

as a Master's with 1 major with the degree "Master of Science" (120 ECTS credits)

Examination regulations version: 2010 Responsible: Faculty of Physics and Astronomy

JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record 88|224|-|-|H|2010

## Contents

The subject is divided into		6
Content and Objectives of th	ie Programme	7
	tions, Notes, In accordance with	8
Compulsory Courses		9
Advanced Practical Course Master		10
Professional Specialization Nanostr	ucture Technology	12
Scientific Methods and Project Man	agement Nanostructure Technology	13
Compulsory Electives		14
Compulsory Electives Nano	matrix	15
Nanomatrix Inorganic Materials Ch		16
Nanoparticle Synthesis and Struct		17
Nanomatrix Heat Insulating System		18
Nanomatrix Semiconductor Materi		19
Nanomatrix Semiconductor Proces		20
Nanomatrix Micro/Nano- and Opto Nanomatrix Biomedical Materials		21 22
Nanomatrix Biocompatible Structu	· ·	22
Nanomatrix Biophysical Analyzing		24
	alisation Nanostructure Technology	25
Applied Physics and Metro		26
Opto-electronic Material Propertie	•	20
Technology of Sensor and Actor M		29
Organic Semiconductor	C C	30
Electronics		32
Electrochemical Energy Storage a	nd Conversion	33
Visiting Research Project		34
Reproducing Sensors in Infrared		35
Applied Superconduction		37
Principles of Image Processing Principles of Energy Technologies		39 41
Introduction to Plasmaphysics		41 43
Semiconductor Lasers - Principles	s and Current Research	45
Principles of Classification of Pat		47
Introduction to LabVIEW		49
Thermodynamics and Economics		51
Nanotechnology in Energy Resear		53
Ultrafast Spectroscopy and Quan	rn Materials: Experiments and Simulations	55
Principles of two- and threedimer	•	56 57
Thermodynamics and Economics		59
Image and Signal Processing in F	hysics	61
Imaging Methods at the Synchrot	•	63
Imaging Methods at the Synchrot		65
Image and Signal Processing in F	hysics	67
Physics of Advanced Materials		69
Quantum Information Technology		70
Solid State Physics and Na		71
Opto-electronic Material Propertie	25	72
Visiting Research Project Applied Superconduction		74
Semiconductor Lasers - Principle	and Current Research	75 77
Applied Semiconductor Physics		79
Master's with 1 major Nanostructure Technology	JMU Würzburg • generated 26-Aug-2024 • exam. reg. da-	page 2 / 268
(2010)	ta record Master (120 ECTS) Nanostrukturtechnik - 2010	puge 2 / 200

Calid State Dhusies a	0.4
Solid State Physics 2 Solid State Spectroscopy	81 83
Transport Phenomena in Solids	85
Semiconductor Physics	87
Semiconductor Nanostructures	89
Lithography in Semiconductor Technology and Theory of Quantum Transport	91
Magnetism	93
Magnetism and Spin Transport	95
Nanoanalytics	97
Low-Dimensional Structures	99
Nanoelectronics	101
Nano-Optics Quantum Mechanics II	103
Quantum Mechanics in Quantum Phenomena in electronic correlated Materials	105
Many Body Quantum Theory	107 109
Relativistic Effects in Mesoscopic Systems	109
Theoretical Solid State Physics	113
Theory of Superconduction	115
Renormalization Group Methods in Field Theory	117
Spintronics	119
Methods in Surface Spectroscopy	121
Electron Electron Interaction	123
Theoretical Solid State Physics 2	125
Principles of two- and threedimensional Röntgen imaging	127
Introduction to Electron Microscopy	129
Field Theory in Solid State Physics	131
Density Functional Theory and the Physics of Oxide Heterostructure Computational Materials Science	133
Computational Materials Science	134 136
Solid State Spectroscopy 2	138
Topology in Solid State Physics	139
Complex Systems, Quantum Control and Biophysics	140
Nano-Optics	141
Biophysical Measurement Technology in Medical Science	143
Laboratory and Measurement Technology in Biophysics	145
Physics of Complex Systems	147
Quantum Information and Quantum Computing	149
Statistics, Data Analysis and Computer Physics	151
Other Modules Specialisation	153
Module Type 4E Special Training Experimental Physics	154
Module Type 4I Special Training Interdisciplinary Research Fields	155
Module Type 4T Special Training Theoretical Physics	156
Module Type 5E Special Training Experimental Physics	157
Module Type 5I Special Training Interdisciplinary Research Fields	158
Module Type 5T Special Training Theoretical Physics	159
Module Type 6E Special Training Experimental Physics	160
Module Type 6I Special Training Interdisciplinary Research Fields	161
Module Type 6T Special Training Theoretical Physics Module Type 8E Special Training Experimental Physics	162 163
Module Type 81 Special Training Interdisciplinary Research Fields	163
Module Type 4N Special Training Nanostructure Technology	165
Module Type 5N Special Training Nanostructure Technology	166
Module Type 6N Special Training Nanostructure Technology	167
Module Type 8N Special Training Nanostructure Technology	168
Current Topics in Nanostructure Technology	169
Current Topics in Nanostructure Technology	170
Current Topics in Nanostructure Technology	171
Master's with 1 major Nanostructure Technology JMU Würzburg • generated 26-Aug-2024 • exam. reg. da-	page 3 / 268

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Current Topics in Nanostructure	Technology	172
Current Topics in Physics		173
Current Topics in Physics		174
Current Topics in Physics Current Topics in Physics		175 176
1	tochnical	
Compulsory Electives Non-		177
Geophysics for Students of Physic		178
	quiring Information - for students of natural sciences Acquiring Information - for students of natural sciences	179
Geophysics for Students of Physic		180 182
Intercultural Competence (English		182
Cultural Studies (English, Advanc		183
Advanced English Final Exam		185
English for the Natural Sciences 1	(Advanced Level)	188
English for the Natural Sciences 2		190
French for the Humanities 1 (Adva		190
French for the Humanities 2 (Adva		194
Intercultural Competence (French	-	196
Intercultural Competence (French		198
Advanced French Final Exam		200
French for Business 1 (Advanced	Level)	201
French for Business 2 (Advanced	Level)	203
Spanish for the Humanities 1 (Adv	vanced Level)	205
Spanish for the Humanities 2 (Ad	vanced Level)	207
Intercultural Competence (Spanis	h, Advanced Level)	209
Cultural Studies (Spanish, Advan	ced Level)	211
Advanced Spanish Final Exam		213
Spanish for Business 1 (Advanced		214
Spanish for Business 2 (Advance	d Level)	216
Operations Research		218
Numerical Mathematics 1		220
Numerical Mathematics 2		222
Advanced Analysis		224
Fundamentals of Commercial Law	I	226
Employment Law		227
Introduction to Companies Law European Company Law		228
Non-technical Minor Subject		229
Databases		231 232
Object-oriented Programming		232
Automation and Control Technolo	)ØV	236
Operating Systems	5)	238
Computer Architecture		239
Programming of Distributed Syste	ems	241
Artificial Intelligence		242
Databases II		243
Program Design and Analysis		244
Applied Analysis		245
Complex Analysis		247
Groups and their Representations	5	249
Numeric of Partial Differential Equ	uations	251
Quantum Control and Quantum C	omputing	253
Basic Course German Civil Code a		255
Basic Course German Civil Code 2		256
Basic Course German Civil Code		257
German and European Trade Mar		258
Copyright Law and Fundamentals	of Patent Law including references to EU Law	259
Master's with 1 major Nanostructure Technology	JMU Würzburg • generated 26-Aug-2024 • exam. reg. da-	page 4 / 268
(2010)	ta record Master (120 ECTS) Nanostrukturtechnik - 2010	

Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Additional Qualifications for Engineers	260
Additional Qualifications for Engineers	261
Employment law for non-law students	262
Information Literacy for Students of the Natural Sciences (Basic Level)	263
Information Literacy for Students of the Natural Sciences (Advanced Level)	265
Thesis	267
Master Thesis Nanostructure Technology	268



## The subject is divided into

section / sub-section	ECTS credits	starting page
Compulsory Courses	36	9
Compulsory Electives	54	14
Compulsory Electives Nanomatrix	24	15
Compulsory Electives Specialisation Nanostructure Technology	24	25
Applied Physics and Metrology	24	26
Solid State Physics and Nanostructures	24	71
Complex Systems, Quantum Control and Biophysics	24	140
Other Modules Specialisation	24	153
Compulsory Electives Non-technical	6	177
Thesis	30	267



### **Content and Objectives of the Programme**

The Master of Science program prepares students for scientific work in the field of Nanostructure Technology. Graduates of the program are qualified to pursue doctoral studies. The objective of the study program is to convey to the student an in-depth understanding of physical and technological principles relevant to the fields of applied physics and nanoscience. The program aims to develop not only physics knowledge, but also analytical thinking and problem solving skills, preparing the student for the constantly evolving fields in which physicists and technologists typically work. The granted degree is internationally comparable to a Masters degree in applied physics or nanotechnology.

## 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:

#### ASPO2007

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

#### 21-Sep-2010 (2010-60)

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**

(36 ECTS credits)

Modul	Module title Abbreviation					
Advan	ced Pra	ctical Course Master			11-PFM-072-m01	
Modul	e coord	inator		Module offered by	1	
Manag	ing Dir	ector of the Institute of	Applied Physics	Faculty of Physics a	and Astronomy	
ECTS	Meth	od of grading	Only after succ. con	Dnly after succ. compl. of module(s)		
6	(not)	successfully completed	11-E1, 11-E2			
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate	11-A3			
Conter	nts					
stems, tic reso superc	proper onance onduct	Nuclear, Atomic and Mo ties of solids, surfaces (NMR) - quantum Hall ( ivity - laser - solid-state	and interfaces. Experir effect - optical pumping	nents on the following	ng topics: X-rays - nu	ıclear magne-
		ning outcomes				
suing s	scientif	conducting experimen ic publications, applica iring practical experime	tion of modern evaluat			
Course	<b>S</b> (type, 1	number of weekly contact hour	s, language — if other than Ger	man)		
man or Fortges	r Englis	nen-Praktikum Master				
		<b>Sessment</b> (type, scope, lang	uage — if other than German, o	examination offered — if no	ot every semester, informati	ion on whether
module i	s creditat	le for bonus)				
1. Lab ring prior ted i 2. Lab ring prior	course the exp r to the f a test course the exp r to the	as the following asses in part 1 (Fortgeschritte periment will be conside experiment. b) Perform is passed. Students m in part 2 (Fortgeschritte periment will be conside experiment. b) Perform is passed. Students m	nen-Praktikum Master, ered successfully comp ing and evaluating the ust prepare an experim enen-Praktikum Master ered successfully comp ing and evaluating the	leted if an oral test ( experiment will be o ent log (approx. 8 pa /Advanced Practical leted if an oral test ( experiment will be o	(approx. 30 minutes) considered successfr ages). Course Master Part (approx. 30 minutes) considered successfr	) is passed ully comple- 2): a) Prepa- ) is passed
Studer Studer pass a	Language of assessment: German or English Students must register for assessment components 1 and 2 online (details to be announced). Students will be offered one opportunity to retake element a) and/or element b) in the respective semester. To pass an assessment component, they must pass both elements (a and b) in the same semester. To pass this module, students must pass both assessment component 1 and assessment component 2.					
Allocat	tion of	places				
Additio	Additional information					
Worklo	Workload					
Teachi	ng cycl	e				
Master's w (2010)	ith 1 majo	r Nanostructure Technology	-	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 10 / 268

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

#### Module appears in

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

Master's degree (1 major) Nanostructure Technology (2010)

Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)

Master's degree (1 major) FOKUS Physics (2010)

Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2006)

Master's degree (1 major) FOKUS Physics (2006)

Modul	Module title Abbreviation					
Profes	sional	Specialization Nano	structure Technology		11-FS-N-072-m01	
Modul	e coord	linator		Module offered by	1	
chairperson of examination committee			nittee	Faculty of Physics	and Astronomy	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
15	nume	rical grade				
Durati	on	Module level	Other prerequisites	5		
1 seme	ester	graduate				
Conter	nts		*			
specia	l releva				e of nanostructure technology with required fundamental topics in a	
Intend	ed lear	ning outcomes				
thesis	and are	e able to summarise	ructure technology with s their knowledge in an ora nours, language — if other than Ge	Il presentation.	the intended topic of the Master's	
			contact hours) and cours		le)	
		sessment (type, scope, ble for bonus)	language — if other than German,	examination offered — if r	not every semester, information on whether	
talk (a	pprox.	30 to 45 minutes) wi	th discussion			
Alloca	tion of	places				
Additi	onal inf	ormation				
Worklo	ad					
	1					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination reg	ulations for teaching-degree progra	ammes)		
Modul	e appea	ars in				
	-		ructure Technology (2011)			
Maste	r's degr	ee (1 major) Nanost	ructure Technology (2010)			

Modul	Module title Abbreviation					
Scient	Scientific Methods and Project Management Nanostructure Technology 11-MP-N-072-mo1					
Modul	e coord	inator		Module offered	by	
chairp	erson o	f examination comm	ittee	Faculty of Physi	cs and Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
15	nume	rical grade				
Durati	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts					
theore	tical, e>		eering questions of nanos		of project planning. Application to ogy. Writing of a scientific project	
Intend	ed lear	ning outcomes				
specia ster's t	l releva thesis, t	nce to the intended o plan the required		is and are able to heir knowledge in	of nanostructure technology with o develop a project plan for the Ma- a an oral presentation.	
R (no i	nformat	tion on SWS (weekly	contact hours) and cours	e language availa	able)	
		<b>Sessment</b> (type, scope, l Ile for bonus)	anguage — if other than German,	examination offered —	if not every semester, information on whether	
talk (a	pprox.	30 to 45 minutes) wit	h discussion			
Alloca	tion of <sub>l</sub>	olaces				
Additi	onal inf	ormation				
Worklo	oad					
Teachi	ing cycl	e				
Referr	ed to in	LPO I (examination regu	lations for teaching-degree progra	ummes)		
Modul	e appea	ars in				



## **Compulsory Electives**

(54 ECTS credits)

The area of mandatory electives (54 ECTS credits) comprises: mandatory electives area NM ("Nanomatrix"): 24 ECTS credits. Out of the nine modules that are offered, four must be successfully completed. mandatory electives area SP ("Spezialausbildung Nanostrukturtechnik" ("Special Training Nanostructure Technology")): 24 ECTS credits. Students must complete no less than three modules. Within the area SP, modules are grouped together by subject. Students may select modules worth a maximum of 24 ECTS credits from one of these module groups. Students also have the option to select modules from different module groups and worth different numbers of credits (total number of credits achieved must be 24). mandatory electives area NT ("Nicht-technischer Wahlbereich" ("Non-technical Electives")): 6 ECTS credits. Students must take a minimum of one module.



# **Compulsory Electives Nanomatrix** (24 ECTS credits)

Out of the nine modules that are offered, four must be successfully completed.

Master's with 1 major Nanostructure Technology (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Master (120 ECTS) Nanostrukturtechnik - 2010

page 15 / 268

Module	e title				Abbreviation
Nanom	atrix Ir	organic Materials Chem	istry (Master)		08-NM-AW-MA-072-m01
Module	e coord	inator		Module offered by	<u> </u>
Dean o Pharma		es Chemie and Pharmazi	e (Chemistry and	Chair of Chemical T	echnology of Material Synthesis
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)	
6 numerical grade					
Duratio	on	Module level	Other prerequisites	;	
1 seme	ster	graduate			
Conten	Its				
science organic	e, nano c mater	-structuring technologies ials chemistry.			chnology fields of materials ent, in particular in the area of in-
	-	ning outcomes			
		e developed advanced kr neering work, in particula	-	• •	ation directions or technology stry.
Course	<b>S</b> (type, r	number of weekly contact hours,	language — if other than Ge	rman)	
V + R (r	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)
		<b>sessment</b> (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether
		mination (approx. 90 mir oral examination in group			) oral examination of one candi- rt (approx. 10 pages)
Allocat	ion of <sub>l</sub>	places			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	ammes)	
Module	e appea	ars in			
Master	's degr	ee (1 major) Nanostructu	re Technology (2010)		
		ee (1 major) FOKUS Physi			
Master	's degr	ee (1 major) FOKUS Physi	cs - Nanostructuring	Technology (2006)	

Module	e title				Abbreviation
Nanopa	article	Synthesis and Structurin	g Technologies (Mas	ster)	08-NM-NS-MA-072-m01
Module	e coord	inator		Module offered by	
Dean o Pharma		es Chemie and Pharmazi	e (Chemistry and	Chair of Chemical T	echnology of Material Synthesis
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
6 numerical grade					
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	Its				
science noparti	e, nano icle syr	-structuring technologies thesis and structuring te	and components an		chnology fields of materials ent, in particular in the area of na-
	-	ning outcomes	-		
		•	-		ation directions or technology d structuring technologies.
Course	<b>S</b> (type, r	number of weekly contact hours, I	anguage — if other than Ge	rman)	
V + R (r	10 infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		<b>sessment</b> (type, scope, langua vle for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether
		mination (approx. 90 mir oral examination in group			) oral examination of one candi- rt (approx. 10 pages)
Allocat	ion of <sub>l</sub>	places			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	ammes)	
Module	e appea	ars in			
	-	ee (1 major) Nanostructu	•, •		
		ee (1 major) FOKUS Physi			
Master	's degr	ee (1 major) FOKUS Physi	cs - Nanostructuring	Technology (2006)	

Modul	e title				Abbreviation
Nanom	atrix H	eat Insulating Systems a	and Photovoltaics		11-NM-WP-MA-072-m01
Modul	e coord	inator		Module offered by	,
Managing Director of the Institute of Applied Physics			oplied Physics	Faculty of Physics	and Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
6	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 semester graduate					
Conter	Its				
nics, p	hotonic Iring, co	s and biophysics as well	as in the technology	-oriented materials	of energy engineering, electro- sciences, technologies of nano- rmal insulation systems and pho
Intend	ed lear	ning outcomes			
		have advanced knowledg he field of thermal insula			gy areas of engineering work,
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)	
V + R (1	10 infor	mation on SWS (weekly o	contact hours) and co	ourse language avai	lable)
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if n	ot every semester, information on whether
		mination (approx. 90 mir oral examination in group			c) oral examination of one candi- rt (approx. 10 pages)
Allocat	ion of <sub>l</sub>	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	immes)	
Modul	e appea	ars in			
Master	's degr	ee (1 major) Nanostructu	re Technology (2010)		
	-	ee (1 major) FOKUS Physi	_		
Master	's degr	ee (1 major) FOKUS Physi	cs - Nanostructuring	Technology (2006)	

Module	Module title         Abbreviation					
Nanom	atrix S	emiconductor Materi	als (Master)		11-NM-HM-MA-072-m01	
Module	e coord	inator		Module offered by	y	
Manag	ing Dire	ector of the Institute o	f Applied Physics	Faculty of Physics	and Astronomy	
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)		
6	nume	rical grade				
Duration Module level Other prerequisites						
1 semester graduate						
Conten	ts		•			
nics, p	hotonic	s and biophysics as		oriented materials	s of energy engineering, electro- s sciences, technologies of nano- miconductor materials.	
Intend	ed lear	ning outcomes				
		have advanced know he field of semicondu		olication or technol	ogy areas of engineering work,	
Course	<b>S</b> (type, r	number of weekly contact ho	urs, language — if other than Ge	rman)		
V + R (r	no infor	mation on SWS (wee	kly contact hours) and co	ourse language ava	ilable)	
		<b>sessment</b> (type, scope, la le for bonus)	nguage — if other than German,	examination offered — if	not every semester, information on whethe	
			minutes) or b) talk (appl oups (approx. 30 minute		c) oral examination of one candi ort (approx. 10 pages)	
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regula	ations for teaching-degree progra	ammes)		
Module	e appea	ars in				
	-		cture Technology (2010)			
	0	. , ,	nysics - Nanostructuring	<b>U</b> , <b>v</b> , <i>v</i>		
Master	's degr	ee (1 major) FOKUS Pl	nysics - Nanostructuring	Technology (2006)		

Module title					Abbreviation
Nanom	atrix S	emiconductor Proces	sing (Master)		11-NM-HP-MA-072-m01
Module	e coord	inator		Module offered by	/
Manag	ing Dire	ector of the Institute o	f Applied Physics	Faculty of Physics	and Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
6	nume	rical grade			
Duratio	on	Module level	Other prerequisites	i	
1 seme	ster	graduate			
Conten	ts				
nics, p	hotonic	s and biophysics as v	vell as in the technology	-oriented materials	s of energy engineering, electro- sciences, technologies of nano- miconductor processes.
Intend	ed lear	ning outcomes			
		have advanced knowl he field of semicondu		olication or technolo	ogy areas of engineering work,
Course	<b>S</b> (type, r	number of weekly contact hou	urs, language — if other than Ge	rman)	
V + R (r	no infor	mation on SWS (week	kly contact hours) and co	ourse language avai	ilable)
		<b>sessment</b> (type, scope, lar le for bonus)	nguage — if other than German,	examination offered — if r	not every semester, information on whethe
			minutes) or b) talk (app oups (approx. 30 minute		c) oral examination of one candi ort (approx. 10 pages)
Allocat	ion of p	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regula	tions for teaching-degree progra	ammes)	
Module	e appea	ars in			
	-		cture Technology (2010)		
	0	. , ,	nysics - Nanostructuring	<b>U</b> , <b>(</b>	
Master	's degr	ee (1 major) FOKUS Pł	nysics - Nanostructuring	Technology (2006)	

Module title					Abbreviation
Nanom	atrix M	icro/Nano- and Optoel	ectronic Devices (Mas	ter)	11-NM-MB-MA-072-m01
Module	e coord	inator		Module offered	d by
Manag	ing Dire	ector of the Institute of <i>I</i>	Applied Physics	Faculty of Phys	sics and Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s	;)
6	nume	rical grade		-	
Duratio	on	Module level	Other prerequisites	;	
1 seme	ster	graduate			
Conten	Its		- <b>I</b>		
nics, pl structu compo	hotonic ring, co nents.	s and biophysics as we omponents and system	ell as in the technology	-oriented mater	elds of energy engineering, electro- ials sciences, technologies of nano f micro-/nano- and opto-electronic
Intend	ed lear	ning outcomes			
					nology areas of engineering work,
		he field of micro-, nano		•	
	-	umber of weekly contact hours			
· · ·		mation on SWS (weekly			· · ·
		<b>essment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered -	— if not every semester, information on whethe
			 inutes) or b) talk (app)	rox. 30 minutes)	or c) oral examination of one candi
					report (approx. 10 pages)
Allocat	ion of p	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)	
Module	e appea	ars in			
Master	's degr	ee (1 major) Nanostruct	ure Technology (2010)		
	•	ee (1 major) FOKUS Phy	-	•, .	-
Master	's degr	ee (1 major) FOKUS Phy	sics - Nanostructuring	Technology (20)	

Module title					Abbreviation
Nanom	atrix B	iomedical Materials	(Master)		03-NM-BW-MA-072-m01
Module	e coord	inator		Module offered by	,
•		f examination comm me Human-Compute	ittee of the Master's de- r Interaction	Faculty of Medicin	e
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
6	nume	rical grade			
Duratio	'n	Module level	Other prerequisites	;	
1 seme	ster	graduate			
Conten	ts				
turing t	echnol				uses materials science, nanostruc le area of biomedical materials.
			nced knowledge in at lea us on biomedical materia		rea or technology focus of engi-
Course	<b>S</b> (type, r	number of weekly contact h	ours, language — if other than Ge	rman)	
V + R (r	io infoi	mation on SWS (wee	ekly contact hours) and co	ourse language avai	lable)
		<b>sessment</b> (type, scope, la ble for bonus)	anguage — if other than German,	examination offered — if n	ot every semester, information on whether
			o minutes) or b) talk (approvention of the minutes) or b) talk (approx. 30 minutes)		c) oral examination of one candi- ort (approx. 10 pages)
Allocat	ion of <sub>l</sub>	places			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ıg cycl	e			
Referre	d to in	LPO I (examination regu	lations for teaching-degree progra	ammes)	
Module	e appea	ars in			
Master	's degr	ee (1 major) Nanostri	ucture Technology (2010)		
	-		hysics - Nanostructuring	<b>C</b> ,	
Master	's degr	ee (1 major) FOKUS P	hysics - Nanostructuring	Technology (2006)	

Module title					Abbreviation
Nanom	atrix B	iocompatible Structu	ring Technologies (Maste	er)	07-NM-BS-MA-072-m01
Modul	e coord	inator		Module offered	i by
Dean o	f Studi	es Biologie (Biology)		Faculty of Biolo	ogy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s	)
6	nume	rical grade			
Duratio	on .	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	Its		U		
engine science biocom	ering, e e, nano npatible	electronics and photo -structuring technolo e structuring technolo	nics, and biophysical app gies and components and	plications and t	k in the application directions powe he technology fields of materials opment, in particular in the area of
		ning outcomes			
		•	knowledge and skills in o cular in the area of biocor		lication directions or technology Iring technologies.
Course	<b>S</b> (type, r	number of weekly contact ho	ours, language — if other than Ger	man)	
V + R (r	no infor	mation on SWS (wee	kly contact hours) and co	urse language a	available)
module i	s creditab	le for bonus)			- if not every semester, information on whethe
			minutes) or b) talk (appro oups (approx. 30 minutes		or c) oral examination of one cand report (approx. 10 pages)
Allocat	ion of <sub>l</sub>	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regul	ations for teaching-degree progra	mmes)	
Module	e appea	ars in			
	-		icture Technology (2010)		
Master	's degr	ee (1 major) FOKUS P	hysics - Nanostructuring ]	Tochnology (201	
			hysics - Nanostructuring 1	•, •	-

Module title					Abbreviation	
Nanon	natrix B	iophysical Analyzing	Systems and Processes	(Master)	11-NM-BV-MA-072-m01	
Modul	Module coordinator			Module offere	ered by	
Manag	ging Dire	ector of the Institute of	of Applied Physics	Faculty of Phy	vsics and Astronomy	
ECTS	Meth	od of grading	Only after succ. com	pl. of module	(s)	
6	nume	rical grade				
Durati	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conte	nts					
nics, p structu procec	hotonio uring, co lures.	s and biophysics as omponents and syste	well as in the technology	oriented mate	ields of energy engineering, electro- rials sciences, technologies of nano of biophysical analysis systems and	
		ning outcomes				
			ledge of one or more app al analysis systems and te		nnology areas of engineering work,	
Course	<b>es</b> (type, r	number of weekly contact ho	ours, language — if other than Ger	man)		
V + R (	no infoi	mation on SWS (wee	kly contact hours) and co	urse language	available)	
		<b>sessment</b> (type, scope, la le for bonus)	anguage — if other than German, e	examination offered	d — if not every semester, information on whethe	
					s) or c) oral examination of one cand report (approx. 10 pages)	
	tion of	-				
Additi	onal inf	ormation				
Workle	oad					
Teachi	ng cycl	e				
Referr	ed to in	LPO I (examination regul	ations for teaching-degree progra	mmes)		
Modul	e appea	ars in				
			Icture Technology (2010)			
	•		hysics - Nanostructuring hysics - Nanostructuring	• • • •	-	



# **Compulsory Electives Specialisation Nanostructure Technology** (24 ECTS credits)

Out of the 24 modules that are offered, no less than three must be completed.

Master's with 1 major Nanostructure Technology (2010)

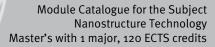


## **Applied Physics and Metrology**

(24 ECTS credits)

Module	e title				Abbreviation	
Opto-e	lectron	ic Material Properties			11-MOE-092-m01	
Module		instor		Module offered by		
			Applied Dhusies	Faculty of Physics and Astronomy		
	1	ector of the Institute of		· · ·	ind Astronomy	
ECTS	1	od of grading	Only after succ. con	npl. of module(s)		
5		rical grade				
Duratio	on	Module level	Other prerequisites	i i i i i i i i i i i i i i i i i i i		
1 semester graduate		50% of exercises. Co sion to assessment, ve details at the beg be considered a dec students have obtai over the course of th assessment into eff mitted to assessme	Admission prerequisite to assessment: successful completion of approx. 50% of exercises. Certain prerequisites must be met to qualify for admis- sion to assessment. The lecturer will inform students about the respecti- ve 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 ad- mitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification			
Conten	ts			cosment anew.		
		iples of optoelectronic	material properties and	d applications		
	-	ning outcomes				
				charactorictics		
		· · ·	optoelectronic material			
			rs, language — if other than Ger			
			ly contact hours) and co		-	
		<b>sessment</b> (type, scope, lan le for bonus)	guage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
groups	(appro report	x. 30 minutes per can (approx. 10 pages, tim	ninutes) or b) oral exam didate, for modules with ne to complete: 1 to 4 we	n less than 4 ECTS cr	edits approx. 20 mii	nutes) or c)
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
 Teachi	ng cvcl	e				
 Teachii	ng cycl	e				
			ions for teaching-degree progra	Immes)		
			ions for teaching-degree progra	ımmes)		
 Referre	ed to in	LPOI (examination regulat	ions for teaching-degree progra	ımmes)		
 Referre  Module	ed to in e appea	LPO I (examination regulat		ımmes)		
 Referre  Module Bachel	ed to in e appea or' deg	LPOI (examination regulat ars in ree (1 major) Physics (	2010)	ummes)		
 Referre  Module Bachele Master	ed to in e appea or' deg 's degr	LPO I (examination regulat ars in ree (1 major) Physics ( ee (1 major) Physics (2	2010)			
 Referre  Bachele Master Master	ed to in e appea or' deg 's degro	LPO I (examination regulat ars in ree (1 major) Physics ( ee (1 major) Physics (2 ee (1 major) Technolog	2010) 010)	ls (2010)		
 Referre  Bachele Master Master Master Master	ed to in e appea or' deg 's degru 's degru 's degru 's degru	LPO I (examination regulat ars in ree (1 major) Physics ( ee (1 major) Physics (2 ee (1 major) Technolog ee (1 major) Technolog ee (1 major) Nanostruc	2010) 010) ty of Functional Material ty of Functional Material ture Technology (2010)	ls (2010) ls (2009)		
 Referre  Bachele Master Master Master Master	ed to in e appea or' deg 's degru 's degru 's degru 's degru	LPO I (examination regulat ars in ree (1 major) Physics ( ee (1 major) Physics (2 ee (1 major) Technolog ee (1 major) Technolog ee (1 major) Nanostruc	2010) 010) zy of Functional Material zy of Functional Material	ls (2010) ls (2009)		



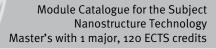


Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) Functional Materials (2012)

Module	e title				Abbreviation
Techno	logy of	f Sensor and Actor Mate	erials including Smart	Fluids	08-SAM-092-m01
Module	e coord	inator		Module offered by	1
holder thesis	of the (	Chair of Chemical Techn	ology of Material Syn-	Chair of Chemical	Technology of Material Synthesis
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites	i	
1 seme	ster	graduate			
Conten	ts				
materia	als and	magnetostrictive mater			s piezoelectrics, shape memory logical fluids, magnetofluids.
		ning outcomes			
Studen	ts have	e developed fundament	al knowledge in the ar	ea of sensory and a	ctuatory materials.
Course	<b>S</b> (type, r	number of weekly contact hours	, language — if other than Gei	rman)	
V + P (r	o infor	mation on SWS (weekly	v contact hours) and co	ourse language avai	lable)
module is	creditab	<b>sessment</b> (type, scope, langu le for bonus) nation (90 minutes)	uage — if other than German, -	examination offered — if r	not every semester, information on whether
Allocat		·			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cvcl	e			
	<u> </u>				
Referre	d to in	<b>LPO I</b> (examination regulation	ons for teaching-degree progra	ammes)	
		examination regulated			
Module	appea	ars in			
		ee (1 major) Physics (20	010)		
	-	ee (1 major) Physics (20			
	-	ee (1 major) Technology			
	-	ee (1 major) Technology		ls (2009)	
	-	ee (1 major) Nanostruct			
master	s aegr	ee (1 major) Nanostruct	ure Technology (2010)		

Module title Abbreviation								
Organio	c Semi	conductor		11-0HL-092-m01				
Module	coord	inator		Module offered by				
Managi	ng Dire	ector of the Institute of	Applied Physics	plied Physics Faculty of Physics and Astronomy				
ECTS	Metho	od of grading	Only after succ. con	Only after succ. compl. of module(s)				
5	nume	rical grade						
Duratio	n	Module level	Other prerequisites	i				
1 semester graduate		50% of exercises. C sion to assessment ve details at the beg be considered a dec students have obtai over the course of th assessment into eff mitted to assessme assessment at a late	Admission prerequisite to assessment: successful completion of approx. 50% of exercises. Certain prerequisites must be met to qualify for admis- sion to assessment. The lecturer will inform students about the respecti- ve 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 ad- mitted 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.					
Conten	ts							
Physica cations	•	iples of organic semico	onductors, molecular a	nd polymer electroni	cs and sensor techn	ology, appli-		
Intende	ed learı	ning outcomes						
The stu	dents l	nave advanced knowle	dge of organic semicor	iductors.				
Courses	<b>5</b> (type, n	umber of weekly contact hou	rs, language — if other than Ge	rman)				
V + Ü (n	io infor	mation on SWS (week	ly contact hours) and co	ourse language avail	able)			
		s <b>essment</b> (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informat	ion on whether		
groups	(appro report	x. 30 minutes per cano (approx. 10 pages, tim	ninutes) or b) oral exam lidate, for modules with e to complete: 1 to 4 we	n less than 4 ECTS cr	edits approx. 20 mir	nutes) or c)		
Allocati	ion of p	olaces						
Additio	nal inf	ormation						
Worklo	ad							
Teachir	ıg cycl	8						
Referre	d to in	LPO I (examination regulat	ions for teaching-degree progra	ummes)				
Module	appea	urs in						
Bacheld Bacheld Master' Master'	Module appears in         Bachelor' degree (1 major) Physics (2010)         Bachelor' degree (1 major) Physics (2012)         Master's degree (1 major) Physics (2010)         Master's degree (1 major) Physics (2011)         Master's degree (1 major) Technology of Functional Materials (2010)							
(2010)			_	generated 26-Aug-2024 • exa er (120 ECTS) Nanostrukturtec	-	page 30 / 268		

#### Julius-Maximilians-UNIVERSITÄT WÜRZBURG



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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2012)

Module	title				Abbreviation
Electro	nics				11-A2-081-m01
Module	coord	inator		Module offered by	
Managi	ng Dire	ector of the Institute of Ap	plied Physics	Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
6	numei	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Conten	ts				
Principl technol		assive and active electro	nic components and	their application in a	analogous and digital circuit
Intende	ed learr	ning outcomes			
The stu circuit t		- ,	actical setup of elect	ronic circuits from th	e field of analogous and digital
Courses	<b>5</b> (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V + Ü (n	io infor	mation on SWS (weekly o	contact hours) and co	ourse language availa	able)
		essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written	examir	nation (approx. 90 minute	es)		
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cycle	9			
Referre	d to in	LPO I (examination regulations	for teaching-degree progra	mmes)	
Module	appea	rs in			
Bachelo	or' degi	ree (1 major) Physics (200	09)		
	-	ree (1 major) Physics (200	-		
		ee (1 major) Physics (2010			
	-	ee (1 major) Nanostructur			
	-	ee (1 major) FOKUS Physic	-	lechnology (2010)	
	-	ee (1 major) FOKUS Physio gree (1 major, 1 minor) Ph			
	-	nation Special study offe	•		

Modul	e title				Abbreviation
Electro	ochemi	al Energy Storage and	Conversion		08-EEW-101-m01
Modul	e coord	inator		Module offered by	
holder thesis	of the	Chair of Chemical Tech	nology of Material Syn-	Chair of Chemical T	echnology of Material Synthesis
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Durati	on	Module level	Other prerequisites		
1 seme	ester	graduate			
Conter	nts				
um an cal doi (Si, CIS	d nicke uble lay S, CIGS,	l metal hydride, sodium	n sulphur, sodium nicko ow batteries, fuel cell sy	el chloride, lithium io /stems (AFC, PEMFC,	ems such as lead, nickel cadmi- on accumulators), electrochemi- DMFC, PAFC, SOFC), solar cells
Studer	nts have		-	nergy storage and c	onversion and are able to apply
Course	es (type, i	number of weekly contact hour	s, language — if other than Gei	rman)	
V + P +	- E (no i	nformation on SWS (we	ekly contact hours) an	d course language a	vailable)
		s <b>essment</b> (type, scope, lang ble for bonus)	uage — if other than German,	examination offered — if no	t every semester, information on whether
writter	n exami	nation (90 minutes) an	d lab report (approx. 5	pages)	
Alloca	tion of	places			
Additi	onal inf	ormation			
Worklo	oad				
Teachi	ing cycl	e			
Referr	ed to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)	
Modul	e appea	ars in			
Bache	lor' deg	ree (1 major) Nanostruc	•, •	)	
Bache Maste	lor' deg r's degr	ree (1 major) Nanostruc ee (1 major) Physics (20	010)	)	
Bache Maste Maste	lor' deg r's degr r's degr	ree (1 major) Nanostruc ee (1 major) Physics (20 ee (1 major) Physics (20	010) 011)		
Bache Maste Maste Maste	lor' deg r's degr r's degr r's degr	ree (1 major) Nanostruc ee (1 major) Physics (20	010) 011) y of Functional Material		

Modul	e title				Abbreviation
Visitin	g Resea	arch Project			11-FPA-112-m01
Modul	e coord	inator		Module offered by	<u>I</u>
Manag	ging Dir	ector of the Institute of A	pplied Physics	Faculty of Physics a	and Astronomy
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	·
10	nume	rical grade			
Durati	on	Module level	Other prerequisites		
1 seme	ester	graduate	Approval by examin	ation committee rec	juired.
Conter	nts				
tific ex	perime		d documentation of t		Physics. Implementation of scien- ly in the context of research visits
Intend	ed lear	ning outcomes			
		are able to independently analyse scientific experim			rimental or Theoretical Physics, to
Course	<b>es</b> (type, 1	number of weekly contact hours,	language — if other than Ge	rman)	
R (no i	nforma	tion on SWS (weekly cont	tact hours) and cours	e language available	e)
		<b>Sessment</b> (type, scope, langua ole for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether
		(approx. 10 to 20 pages) ssessment: German, Eng			
Alloca	tion of	places			
Additi	onal inf	ormation			
Additio	onal inf	ormation on module dura	ation: 1 to 2 semester	s.	
Worklo	oad				
Teachi	ing cycl	e			
Referr	ed to in	LPOI (examination regulation	s for teaching-degree progra	ummes)	
Modul	e appea	ars in			
		ee (1 major) Physics (201	o)		
Maste	r's degr	ee (1 major) Physics (201	1)		
	-	ee (1 major) Nanostructu	•, · ·		
Maste	r's degr	ee (1 major) Nanostructu	re Technology (2010)		

Module title         Abbreviat							
Reproc	ducing	Sensors in Infrared			11-ASI-092-m01		
Modul	e coord	inator		Module offered by			
Manag	ging Dire	ector of the Institute of A	Applied Physics	Faculty of Physics a	nd Astronomy		
ECTS	Metho	od of grading	Only after succ. con	Only after succ. compl. of module(s)			
3	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 semester undergraduate		sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment in sessment at a later	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.				
Conter	nts						
range of up to n from b sical o types of of neur	Infrared cameras are important experimental and technical tools, e.g. for measuring temperatures. The spectral range of infrared ranges from the visible spectrum, where the Sun is dominating as the natural source of light, up to microwaves and radiowaves with artificial emitters. There is distinct and sometimes dominating emission from bodies with ambient temperature in the infrared spectrum. The lecture provides an introduction to the physical optics of this spectral range and discusses: Peculiarities of infrared cameras and thermal images, different types of sensors (bolometer, quantum well, superlattice) as well as the evaluation of such sensors on the basis of neurophysiological aspects.						
	-	ning outcomes					
		nave specific and advar and detector structures			ctral imaging. They k	now various	
Course	<b>es</b> (type, r	umber of weekly contact hours	s, language — if other than Ger	rman)			
V + R (I	no infor	mation on SWS (weekly	/ contact hours) and co	ourse language avail	able)		
		<b>eessment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether	
groups project (appro Assess and wi examir	a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						
Allocat	tion of p	olaces					
Additional information							
Worklo	bad						
Teachi	ng cycl	e					
Master's u	ith 1 maio	Nanostructure Technology	IMI Würzburg	generated 26-Aug-2024 • ex.	am reg da-	page 35 / 268	
(2010)				r (120 ECTS) Nanostrukturtec	-	200	

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

#### Module appears in

Bachelor' degree (1 major) Physics (2010)

Bachelor' degree (1 major) Physics (2012)

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

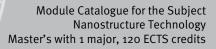
Master's degree (1 major) Nanostructure Technology (2010)

Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)

Master's degree (1 major) FOKUS Physics (2010)

Module	e title		Abbreviation					
Applie	d Supe	rconduction			11-ASL-092-m01			
Module	e coord	inator		Module offered by				
Manag	ing Dire	ector of the Institute of	Applied Physics	plied Physics Faculty of Physics and Astronomy				
ECTS Method of grading			Only after succ. con	Only after succ. compl. of module(s)				
6	nume	rical grade						
Duratio	on	Module level	Other prerequisites	i				
1 semester graduate		graduate	sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	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 anow.				
Conten	Its							
			vity. Application in ene alculation of temperatu			ents. Me-		
Intend	ed lear	ning outcomes						
are abl able to energy	e to ev discus techno	aluate the contribution s questions on superc logy. Furthermore, the	nding of superconductiv s of materials sciences onductivity in a scientif y can deal with practica	to the development ic manner and to crit al mathematical quee	of superconductivity ically question deve	y. They are		
			rs, language — if other than Ge					
			y contact hours) and co					
		<b>Sessment</b> (type, scope, lan Ile for bonus)	guage — if other than German,	examination offered — if no	t every semester, informati	on on whether		
in grou c) proje prox. 3 Assess	ps (app ect repo o minu ment o	prox. 30 minutes per ca ort (approx. 8 pages, ti		vith less than 4 ECTS	credits approx. 20 r	ninutes) or		
Allocat	ion of <sub>l</sub>	olaces						
Additio	onal inf	ormation						
Workload								
Teaching cycle								
Referre	ed to in	LPO I (examination regulat	ions for teaching-degree progra	ammes)				
	e appea							
Bachel	or' deg	ree (1 major) Physics (2	2010)					
Master's w (2010)	ith 1 majo	r Nanostructure Technology		generated 26-Aug-2024 • exa er (120 ECTS) Nanostrukturtec		page 37 / 268		

#### Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

Module	e title		Abbreviation				
Princip	les of I	mage Processing			11-EBV-092-m01		
Module	e coord	inator		Module offered by			
Managing Director of the Institute of Ap			oplied Physics	plied Physics Faculty of Physics and Astronomy			
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
3	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	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						
transfo tic imag	rm. His ge reco	togram equalisation (e.g	. image brightening)	and pixel connectivi	ation. Two-dimensional Fourier ty (e.g. noise reduction). Automa- tion. Applications (e.g. motion		
Intende	ed learı	ning outcomes					
and the le to in	eory of a	signal processing for ima lently work with literature	ges and have corresp e, they understand th	oonding knowledge of e characteristics of i	ssing. They know the principles of image generation. They are ab- mage processing with commerci- imaging measuring methods.		
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V + R (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language availa	able)		
			ge — if other than German, e	examination offered — if no	t every semester, information on whether		
groups project (approx Assess	a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment						
examin	ation r	nounced in due form unc egulations) 2009. ssessment: German, Eng		tion 32 Subsection :	3 ASPO (general academic and		
Allocation of places							
Additional information							
Worklo	Workload						
Teachi	ng cycl	e					

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

#### Module appears in

Bachelor' degree (1 major) Physics (2010)

Bachelor' degree (1 major) Physics (2012)

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

Master's degree (1 major) Nanostructure Technology (2010)

Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)

Master's degree (1 major) FOKUS Physics (2010)

Module	e title			Abbreviation			
Principles of Energy Technologies					11-ENT-092-m01		
Module	e coord	inator		Module offered by			
Managing Director of the Institute of App			plied Physics Faculty of Physics and Astronomy		nd Astronomy		
ECTS	Metho	od of grading	Only after succ. com	Only after succ. compl. of module(s)			
6	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 semester graduate		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				
as rene ting ma studen verters Electric	ewable aterials ts. Ene . Nucle tity. Bio	resources of energy. We a , selective layers, highly a rgy conservation via ther	also discuss aspects activated carbons). Th mal insulation. Therm ectricity. Wind turbing	of optimising materi he course is especia hodynamic energy ef es. Photovoltaics. So	port and energy storage as well als (e.g. nanostructured insula- lly suitable for teaching degree ficiency. Fossil fired energy con- olar thermal: Heat. Solar thermal:		
			fferent methods of en	ergy technology est	pecially energy conversion, trans-		
port an	d stora	ge. They understand the	structures of corresp	onding installations	and are able to compare them.		
		umber of weekly contact hours, l					
		mation on SWS (weekly o					
		s <b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
groups project (approz Assess and wil examir	a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						
Allocation of places							
Additio	Additional information						
Worklo	ad						
Teachi	ng cycl	e					

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

## Module appears in

Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Nanostructure Technology (2010)
Bachelor' degree (1 major) Nanostructure Technology (2012)
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) FOKUS Physics - Nanostructuring Technology (2010)
Master's degree (1 major) FOKUS Physics (2010)
Master's degree (1 major) FOKUS Physics (2011)
Master's degree (1 major) Functional Materials (2012)

Module	e title				Abbreviation		
Introdu	iction t	o Plasmaphysics			11-EPP-092-m01		
Module	e coord	inator		Module offered by			
Manag	ing Dire	ector of the Institute of Th	neoretical Physics	Faculty of Physics and Astronomy			
ECTS	and Astrophysics       ECTS     Method of grading       Only after succ.			ıpl. of module(s)			
6	1	rical grade		<u></u>			
Duratio		Module level	Other prerequisites				
Duration     Module level       1 semester     graduate		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						
Transp thin the celerat Intende The stu ma. The Course V + R (r	ort equ e solar ion anc ed learn idents l ey are a s (type, r no infor	ohysics: Dynamics of cha ations for energetic parti wind, Particle acceleration transport in galaxies an <b>ning outcomes</b> know the principles of Pla able to solve basic proble number of weekly contact hours, mation on SWS (weekly o	cles, Properties of ma on via shock waves an d other astrophysical asma Physics, especi ems of Plasma Physic anguage — if other than Gen contact hours) and co	agnetic turbulence, F nd via interaction with l objects, Cosmic rac ally the description s and to apply this k man) ourse language avail	Propagation of solar th plasma turbulence liation. of transport phenom nowledge to Astroph able)	particles wi- e, Particle ac- ena in plas- nysics.	
		<b>sessment</b> (type, scope, langua ile for bonus)	ge — if other than German,	examination offered — if no	ot every semester, informati	ion on whether	
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English							
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Workload							
Teachi	Teaching cycle						
 D.e.f.							
Keterre	a to in	LPO I (examination regulation	s for teaching-degree progra	immes)			
 Master's w	ith 1 maio	r Nanostructure Technology	IMIT Würzburg	generated 26-Aug-2024 • ex	am, reg. da-	page 43 / 268	
masiel S W	iti i maju	manustructure rectiliology		r (120 ECTS) Nanostrukturtec		page 43 / 200	



Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Mathematical Physics (2009)
Bachelor' degree (1 major) Mathematical Physics (2012)
Master's degree (1 major) Mathematics (2012)
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) Mathematical Physics (2012)
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)
Master's degree (1 major) FOKUS Physics (2010)
Master's degree (1 major) FOKUS Physics (2011)
Master's degree (1 major) Computational Mathematics (2012)

Module	e title				Abbreviation		
Semico	onducto	or Lasers - Principles and	Current Research		11-HLF-092-m01		
Module coordinator				Module offered by			
Managing Director of the Institute of Applied Physics			pplied Physics	Faculty of Physics a	and Astronomy		
ECTS			Only after succ. con	npl. of module(s)			
6	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 semester graduate		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.					
rent de	cture di velopm	ients regarding compone	ents. The principles of	f lasers are describe	semiconductor lasers, and cur- d on the basis of a general laser Basic concepts such as thres-		
riers ar des, la: ductor	nd phot ser reso lasers.	ons. Other topics of the lonators, mode selection,	lecture are optical pro dynamic properties a current topics of laser	ocesses in semicond as well as technology	d rate equations for charge car- uctors, layer and ridge wavegui- y for the generation of semicon- uantum dot lasers, quantum cas-		
Intend	ed lear	ning outcomes					
		have advanced knowledg modern questions and k			er physics. They can apply their opment of components.		
Course	<b>S</b> (type, r	number of weekly contact hours,	language — if other than Ger	rman)			
R + V (r	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)		
			age — if other than German, o	examination offered — if no	ot every semester, information on whether		
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English							
Allocat	ion of <sub>l</sub>	olaces					
Additional information							
Additio	onal inf	ormation					
Additio  Worklo	-	ormation					

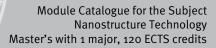
## Teaching cycle

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

Referred to in LPO I (examination regulations for teaching-degree programmes)
Module appears in
Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Nanostructure Technology (2010)
Bachelor' degree (1 major) Nanostructure Technology (2012)
Master's degree (1 major) Mathematics (2012)
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) FOKUS Physics - Nanostructuring Technology (2010)
Master's degree (1 major) FOKUS Physics (2010)
Master's degree (1 major) FOKUS Physics (2011)
Master's degree (1 major) Computational Mathematics (2012)
Master's degree (1 major) Functional Materials (2012)

Module	e title			Abbreviation				
Princip	les of C	Classification of Pattern		11-KVM-092-m01				
Module	e coord	inator		Module offered by				
Managing Director of the Institute of Ap			Applied Physics	plied Physics Faculty of Physics and Astronomy				
ECTS Method of grading			Only after succ. con	Only after succ. compl. of module(s)				
3	nume	rical grade						
Duratio	on	Module level	Other prerequisites					
1 semester undergraduate		sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the set sessment into effect ted to assessment in sessment at a later	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							
terns. T More a discuss	hese p nd mor s princi	as images, but also aco atterns are often classi e automatic procedure ples of different classif <b>hing outcomes</b>	fied and analysed by o s are adopted to take o	bservers, e.g. by a d on these tasks and cl	octor when analysin assify patterns. The	g an ECG.		
		nave specific and adva	 nced knowledge in the	field of nattern reco	gnition They know n	nethods of		
classify	ing pat	tterns in measuring dat s to practical problems	a as well as ways to au					
Course	<b>S</b> (type, n	umber of weekly contact hour	s, language — if other than Ge	rman)				
V + R (r	no infor	mation on SWS (weekly	y contact hours) and co	ourse language avail	able)			
		<b>essment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether		
(approx report ( 30 min Assess and wil examin	a) written examination (90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.							
Language of assessment: German, English Allocation of places								
Additional information								
Workload								
Teaching cycle								
	·							
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)				
		_						
Master's wi (2010)	ith 1 majoi	Nanostructure Technology	-	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 47 / 268		



Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Master's degree (1 major) Physics (2010) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

Module title				Abbreviation	
Introduction	to LabVIEW			11-LVW-092-m01	
Module coord	linator		Module offered by	I	
Managing Director of the Institute of Applied Physics			Faculty of Physics a	and Astronomy	
ECTS Meth	ECTS Method of grading Only after succ.		npl. of module(s)		
6 nume	erical grade				
Duration	Module level	Other prerequisites			
1 semester graduate		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			
Contents	J	admission to assess	Sincht unew.		
on fields of th ming and with on fields, from and measure hensive stand upon LabVIEV to enable the fields. Course through an op computing ar VIEW function ment.	the development environm th common LabVIEW archin m assessment and measur ment analysis. In the adva dalone applications, inclu N Basic 1 and provides an students to successfully topics include technique otimised reuse of existing and methods of error handle his according to individual	ent of LabVIEW. The st tectures. They learn to rement applications anced course "NI Lab ding the graphical de introduction to the n implement and distri es and procedures for codes, usage of file ing. After finishing th	students become act o develop LabVIEW a up to data collection VIEW Core 2", the stre evelopment environn nost common develo bute LabVIEW applion the optimisation of I/O functions, principe course, the studer	n to the functions and applicati- quainted with dataflow program- applications for various applicati- n, device control, data recording udents learn to develop compre- ment LabVIEW. The course builds opment technologies, in order cations for different application application performance, e.g. ples of data management, event nts have the ability to apply Lab- productive application develop-	
Intended lear	ning outcomes				
	•	_		LabVIEW. They know the princip- ding and analysing measuring da-	
Courses (type,	number of weekly contact hours, I	anguage — if other than Ger	rman)		
V + Ü (no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)	
Method of as module is credita		ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) or e) project (approx. 60 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English					
Allocation of	places				

#### **Additional information**

Workload

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Teaching cycle

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

#### Module appears in

Bachelor' degree (1 major) Physics (2010)

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

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

Master's degree (1 major) Nanostructure Technology (2010)

Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)

Master's degree (1 major) FOKUS Physics (2010)

	e title				Abbreviation	
Thermo	odynar	nics and Economics			11-TDO-092-m01	
Module	e coord	linator		Module offered by		
Managing Director of the Institute of Theoretical Physics and Astrophysics			Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	<u> </u>	od of grading	Only after succ. compl. of module(s)			
6	nume	erical grade				
Duratio	on	Module level	Other prerequisites	i		
1 semester graduate		sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	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	nts	1				
fine the	e techn	mage and resource con ological and ecologica	sumption. Energy conv l boundaries of industr	ial economic growth	luction and natural r . Part 2 analyses how	esources de- w the factors
fine the capital nomic system tors lea discuss compri	e techn l, work, growth n of taxe ads to j ses how ises the	mage and resource con ological and ecologica energy and creativity p . The productive power es and social security c ob cuts, waste of resou w factor income taxatio e techniques of rational	sumption. Energy conv	rersion, entropy prod ial economic growth services of a nationa exceeds that of expe epancy between pow of nations and growi evelopment. Part 3 i ossil energy use, and	luction and natural r . Part 2 analyses how Il economy and dete ensive labour. Within ver and costs of proo ng social tensions. T ncludes seminar pre	esources de- w the factors mine eco- n the current duction fac- The course esentations,
fine the capital nomic system tors lea discuss compri gramm	e techn I, work, growth n of tax ads to j ses hou ises the ne deec	mage and resource con ological and ecologica energy and creativity p . The productive power es and social security c ob cuts, waste of resou w factor income taxatio e techniques of rational	Isumption. Energy conv l boundaries of industr produce the goods and of cheap energy by far contributions, this discr urces, impoverishment on can counteract this d l energy use and non-fo	rersion, entropy prod ial economic growth services of a nationa exceeds that of expe epancy between pow of nations and growi evelopment. Part 3 i ossil energy use, and	luction and natural r . Part 2 analyses how Il economy and dete ensive labour. Within ver and costs of proo ng social tensions. T ncludes seminar pre	esources de- w the factors mine eco- n the current duction fac- The course esentations,
fine the capital nomic; system tors lea discuss compri gramm Intende The stu in the v connec mies. T NOTE:	e techn l, work, growth n of tax ads to j ses hou ises the ne deec ed lear udents world's ctions b They ar this is	mage and resource con ological and ecologica energy and creativity p . The productive power es and social security c ob cuts, waste of resour w factor income taxatio e techniques of rational o (Dynamic Energy, Em <b>ning outcomes</b> understand that energy economic and social d between thermodynamic e able to apply the acquit the module that was ru	Isumption. Energy conv l boundaries of industr produce the goods and of cheap energy by far contributions, this discr urces, impoverishment on can counteract this d l energy use and non-fo	rersion, entropy prod ial economic growth services of a national exceeds that of expe- epancy between pow of nations and growi evelopment. Part 3 i possil energy use, and zation).	luction and natural r . Part 2 analyses how al economy and deter ensive labour. Within ver and costs of proo ng social tensions. T ncludes seminar pre introduces the option ing to play an impor cheory, the students obysical basis of mo ed. As the module w	esources de- w the factors mine eco- n the current duction fac- The course esentations, misation pro- tant role know the dern econo-
fine the capital nomic ; system tors lea discuss compri gramm Intende The stu in the v connec mies. T NOTE: 1 his own	e techn l, work, growth n of tax ads to j ses hou ises the ne deec ed lear udents world's ctions b They ar this is n theor	mage and resource con ological and ecologica energy and creativity p . The productive power es and social security c ob cuts, waste of resour w factor income taxatio e techniques of rational o (Dynamic Energy, Em <b>ning outcomes</b> understand that energy economic and social d between thermodynamic e able to apply the acquit the module that was ru y of economy, it has ye	Isumption. Energy conv I boundaries of industr produce the goods and of cheap energy by far contributions, this discr urces, impoverishment on can counteract this d I energy use and non-fo ission and Cost Optimi y conversion and entrop levelopment. As an exter ics and economy as we uired knowledge to par n by Prof. Dr. R. Kümme et to be decided whethe	rersion, entropy prod ial economic growth services of a national exceeds that of expe epancy between pow of nations and growi evelopment. Part 3 i possil energy use, and zation).	luction and natural r . Part 2 analyses how al economy and deter ensive labour. Within ver and costs of proo ng social tensions. T ncludes seminar pre- introduces the option ing to play an impor cheory, the students ohysical basis of mo ed. As the module w offer this module.	esources de- w the factors mine eco- n the current duction fac- The course esentations, misation pro- tant role know the dern econo-
fine the capital nomic; system tors lea discuss compri gramm Intende The stu in the v connec mies. T NOTE: t his own Course R + V (r	e techn l, work, growth n of tax ads to j ses hou ises the e deec ed lear udents world's ctions b They are this is n theor es (type, no info	mage and resource con ological and ecological energy and creativity p . The productive power es and social security c ob cuts, waste of resource w factor income taxation te techniques of rational o (Dynamic Energy, Em <b>ning outcomes</b> understand that energy economic and social d between thermodynamic e able to apply the acquir the module that was ru y of economy, it has ye number of weekly contact hour rmation on SWS (weekly	Isumption. Energy conv l boundaries of industr produce the goods and of cheap energy by far contributions, this discr urces, impoverishment on can counteract this d l energy use and non-fo ission and Cost Optimi y conversion and entrop levelopment. As an exto ics and economy as we uired knowledge to par n by Prof. Dr. R. Kümme et to be decided whethe rs, language — if other than Ge	rersion, entropy prod ial economic growth services of a national exceeds that of expe epancy between pow of nations and growi evelopment. Part 3 i ossil energy use, and zation). by production are go ension of economic t ll as the productive p ticular problems. el, who has now retir rr we will continue to rman) burse language avail	luction and natural r . Part 2 analyses how al economy and deter ensive labour. Within ver and costs of pro- ng social tensions. T ncludes seminar pre- introduces the option ing to play an impor cheory, the students ohysical basis of mo ed. As the module w offer this module.	esources de- w the factors mine eco- n the current duction fac- The course esentations, misation pro- tant role know the dern econo- vas tailored to
fine the capital nomic ; system tors lea discuss compri gramm Intenda The stu in the v connec mies. T NOTE: f his own R + V (r Method	e techn l, work, growth n of tax ads to j ses hou ises the ne deec ed lear udents world's ctions k They ard this is n theor es (type, no info d of as	mage and resource con ological and ecological energy and creativity p . The productive power es and social security c ob cuts, waste of resource w factor income taxation te techniques of rational o (Dynamic Energy, Em <b>ning outcomes</b> understand that energy economic and social d between thermodynamic e able to apply the acquir the module that was ru y of economy, it has ye number of weekly contact hour rmation on SWS (weekly	Isumption. Energy conv I boundaries of industr produce the goods and of cheap energy by far contributions, this discr urces, impoverishment on can counteract this d I energy use and non-fo ission and Cost Optimi y conversion and entrop levelopment. As an exter ics and economy as we uired knowledge to par n by Prof. Dr. R. Kümme et to be decided whethe	rersion, entropy prod ial economic growth services of a national exceeds that of expe epancy between pow of nations and growi evelopment. Part 3 i ossil energy use, and zation). by production are go ension of economic t ll as the productive p ticular problems. el, who has now retir rr we will continue to rman) burse language avail	luction and natural r . Part 2 analyses how al economy and deter ensive labour. Within ver and costs of pro- ng social tensions. T ncludes seminar pre- introduces the option ing to play an impor cheory, the students ohysical basis of mo ed. As the module w offer this module.	esources de- w the factors mine eco- n the current duction fac- The course esentations, misation pro- tant role know the dern econo- vas tailored to
fine the capital nomic; system tors lea discuss compri gramm Intende The stu in the v connect mies. T NOTE: t his own Course R + V (r Method module is a) writt groups project (appro: Assess and wil examin	e techn l, work, growth n of tax ads to j ses hou ises the de deec ed lear udents world's ctions b They are this is n theor es (type, no info d of as: s creditat ten exa s creditat ten exa s creditat ten exa s creditat ten exa s creditat	mage and resource com pological and ecologica energy and creativity p . The productive power es and social security c ob cuts, waste of resource w factor income taxatio e techniques of rational o (Dynamic Energy, Em <b>ning outcomes</b> understand that energy economic and social d between thermodynamic e able to apply the acquir the module that was ru y of economy, it has yee number of weekly contact hour rmation on SWS (weekl sessment (type, scope, lang ble for bonus) mination (approx. 90 m ox. 30 minutes per cance (approx. 8 to 10 pages ninutes) offered: When and how	nsumption. Energy conv l boundaries of industr produce the goods and of cheap energy by far contributions, this discr arces, impoverishment on can counteract this d l energy use and non-fo ission and Cost Optimi y conversion and entrop levelopment. As an exte ics and economy as we uired knowledge to par n by Prof. Dr. R. Kümme et to be decided whethe rs, language – if other than Ge ly contact hours) and co guage – if other than German, ininutes) or b) oral exam didate, for modules with t, time to complete: 1 to often assessment will l under observance of Sec	rersion, entropy prod ial economic growth services of a national exceeds that of expe epancy between pow of nations and growi evelopment. Part 3 i possil energy use, and zation). by production are go ension of economic t ll as the productive p ticular problems. el, who has now retir rr we will continue to rman) purse language avail examination offered — if no h less than 4 ECTS cr 4 weeks) or d) prese	luction and natural r Part 2 analyses how al economy and deterensive labour. Within ver and costs of pro- ng social tensions. T ncludes seminar pre- introduces the option ing to play an impor- theory, the students obysical basis of mo- ed. As the module w offer this module. able) of every semester, informat edate each or oral ex- redits approx. 20 min entation/seminar pre- on the method of as:	esources de- w the factors mine eco- n the current duction fac- The course esentations, misation pro- tant role know the dern econo- vas tailored to ion on whether amination in nutes) or c) esentation sessment
fine the capital nomic; system tors lead discuss compri- gramm Intende The stu- in the v connect mies. T NOTE: this own Course R + V (r Method module is a) writt groups project (appro: Assess and will examin	e techn l, work, growth n of tax ads to j ses hou ises the de deec ed lear udents world's ctions b They are this is n theor es (type, no info d of as: s creditat ten exa s creditat ten exa s creditat ten exa s creditat ten exa s creditat	mage and resource con hological and ecological energy and creativity p . The productive power es and social security c ob cuts, waste of resource w factor income taxation te techniques of rational o (Dynamic Energy, Em <b>ming outcomes</b> understand that energy economic and social d between thermodynamic e able to apply the acquir the module that was ru- y of economy, it has yee number of weekly contact hour rmation on SWS (weekl sessment (type, scope, lang ble for bonus) mination (approx. 90 m ox. 30 minutes per cano c (approx. 8 to 10 pages ninutes) offered: When and how mounced in due form u regulations) 2009.	nsumption. Energy conv l boundaries of industr produce the goods and of cheap energy by far contributions, this discr arces, impoverishment on can counteract this d l energy use and non-fo ission and Cost Optimi y conversion and entrop levelopment. As an exte ics and economy as we uired knowledge to par n by Prof. Dr. R. Kümme et to be decided whethe rs, language – if other than Ge ly contact hours) and co guage – if other than German, ininutes) or b) oral exam didate, for modules with t, time to complete: 1 to often assessment will l under observance of Sec	rersion, entropy prod ial economic growth services of a national exceeds that of expe epancy between pow of nations and growi evelopment. Part 3 i possil energy use, and zation). by production are go ension of economic t ll as the productive p ticular problems. el, who has now retir rr we will continue to rman) purse language avail examination offered — if no h less than 4 ECTS cr 4 weeks) or d) prese	luction and natural r Part 2 analyses how al economy and deterensive labour. Within ver and costs of pro- ng social tensions. T ncludes seminar pre- introduces the option ing to play an impor- theory, the students obysical basis of mo- ed. As the module w offer this module. able) of every semester, informat edate each or oral ex- redits approx. 20 min entation/seminar pre- on the method of as:	esources de- w the factors mine eco- n the current duction fac- The course esentations, misation pro- tant role know the dern econo- vas tailored to ion on whether amination in nutes) or c) esentation sessment

## Allocation of places

#### Additional information

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# Workload

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## Teaching cycle

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

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## Module appears in

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010)

Module	e title		Abbreviation					
Nanote	echnolo	11-NTE-092-m01						
Module	e coord	inator		Module offered by				
Managing Director of the Institute of Ap			plied Physics Faculty of Physics and Astronomy		nd Astronomy			
ECTS Method of grading		Only after succ. con	Only after succ. compl. of module(s)					
4	nume	rical grade						
Duratio	on	Module level	Other prerequisites					
1 semester graduate		graduate	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	its							
and str cal com accum cuum i Intendo The stu researc They an	ructures itexts. I ulators nsulati ed lean idents idents ch. They re able	s that have optimised pro t uses specific materials , functional nanoscale lay ons and electrode materi ning outcomes have specific and advance	perties due to effects and components as e yer and particle syste als. ed knowledge of the echnology to influen- to specific questions	s of nanotechnology. examples, such as th ms with spectral self application of nanot ce the properties of r 5.	vers special materials, surfaces . It explains the underlying physi- nermal insulation materials, heat ective properties, nanoporous va- technology in the field of energy materials and their applications.			
V + R (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language availa	able)			
module is a) writt groups project	<ul> <li>V + R (no information on SWS (weekly contact hours) and course language available)</li> <li>Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)</li> <li>a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation</li> </ul>							
Assess and wi	ment o ll be an				on the method of assessment 3 ASPO (general academic and			
Allocation of places								
Additional information								
Worklo	ad							
Teachi	ng cycl	e						

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

#### Module appears in

Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010)

Modul	e title				Abbreviation
Ultrafa	st Spe	ctroscopy and Quant	tum Control		08-PCM4-PHY-111-m01
Modul	e coord	inator		Module offered by	, ,
	r of the enkonti		eitspektroskopie and	Institute of Physica	al and Theoretical Chemistry
ECTS	Meth	od of grading	Only after succ. co	mpl. of module(s)	
5	nume	rical grade			
Duratio	on	Module level	Other prerequisite	s	
1 seme	ster	graduate			
Conten	Its		1		
			topics in ultrafast spectr pectroscopy and cohere		o control. It focuses on ultrashor
Intend	ed lear	ning outcomes			
plain tl	he theo		aser spectroscopy and n		haracterise them. They can ex- ethods. They can describe the
Course	<b>S</b> (type, I	number of weekly contact h	ours, language — if other than G	erman)	
S + Ü (I	no info	rmation on SWS (wee	ekly contact hours) and o	course language avai	lable)
		<b>Sessment</b> (type, scope, l ile for bonus)	anguage — if other than German	, examination offered — if r	ot every semester, information on whether
		nation (90 minutes) ssessment: German		ne candidate each (2	o minutes) or talk (30 minutes)
Allocat	ion of	places			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng rvrl	e			
		•			
Referre	ad to in	IPOL (ovamination same	lations for teaching-degree prog	rammos)	
Referre			lations for reaching-degree prog	iaiiiille5)	
Module	e anne:	ars in			
		ee (1 major) Physics	(2010)		
		ee (1 major) Physics			
	-		ucture Technology (2011)	)	
	-		ucture Technology (2010		
	-	ee (1 major) FOKUS F			

Module	e title				Abbreviation
Structu	ire and	Properties of Modern Ma	aterials: Experiments	and Simulations	08-MW-PHY-111-m01
Module	e coord	inator		Module offered by	J
holder thesis	ofthe	Chair of Chemical Techno	logy of Material Syn-	Chair of Chemical	Technology of Material Synthesis
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Materia simulat		erties of metals and cera	mics: correlation of s	tructure/property re	lations through experiments and
Intende	ed lear	ning outcomes			
mance	cerami pecial f	cs. They are introduced t	o measuring method	s and calculation m	uminium alloys and high-perfor- ethods using numerical simulati- of materials and the resulting pro-
Course	<b>S</b> (type, r	number of weekly contact hours, I	anguage — if other than Ger	rman)	
V + S (r	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avai	lable)
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if n	ot every semester, information on whether
talk (ap	prox. 4	45 minutes)			
Allocat	ion of <sub>l</sub>	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	d to in	LPOI (examination regulation	s for teaching-degree progra	mmes)	
Module	appea	ars in			
Master	's degr	ee (1 major) Physics (201	o)		
	-	ee (1 major) Physics (201			
	-	ee (1 major) Nanostructu			
Master	's degr	ee (1 major) Nanostructu	re Technology (2010)		

Module	e title				Abbreviation	
Princip	les of t	wo- and threedimensio	nal Röntgen imaging		11-ZDR-111-m01	
Modul	e coord	inator		Module offered by	I	
		ector of the Institute of A	Applied Physics	Faculty of Physics a	and Astronomy	
ECTS	<u> </u>	od of grading	Only after succ. co	· · ·	,	
6		rical grade		•		
Duratio	on	Module level	Other prerequisite	s		
sessment. The lea at the beginning sidered a declara dents have obtain the course of the sessment into eff ted to assessment sessment at a lat			sessment. The lect at the beginning of sidered a declarati dents have obtained the course of the se sessment into effect ted to assessment	es must be met to qu urer will inform stude the course. Registrat on of will to seek adm ed the qualification for emester, the lecturer ct. Students who mee in the current or in the date, students will h syment anew.	ents about the respe tion for the course v nission to assessme or admission to asse will put their registr et all prerequisites v ne subsequent seme	ective details will be con- ent. If stu- essment over ration for as- will be admit- ester. For as-
Conten	its					
ton abs project traction characc Intende The stu technic Course V + R (r Method module is a) writt groups project (appro: Assess	sorption ion, Fo n, visua terisati ed learn idents l ques us s (type, r no infor d of ass s creditab cen exan (appro c report x. 30 m sment o	ffered: When and how c	f X-ray detection. Mat rative methods). Imag ns of X-ray imaging in ). Radiation protect enerating X-rays and of image processing , language — if other than G contact hours) and c inge — if other than German date, for modules wit time to complete: 1 to often assessment will	thematics of reconstr ge processing (image the industrial sector ion and biological ra- of their interactions we as well as application erman) course language avail , examination offered — if nu- mination of one cand th less than 4 ECTS co o 4 weeks) or d) presen-	uction algorithms (f data pre-processin (component testing diation effect (dose with matter. They kr on areas of these me lable) ot every semester, information idate each or oral ex- redits approx. 20 m entation/seminar p on the method of as	filtered rear lg, feature ex- g, material ,). now imaging ethods. ation on whether xamination in inutes) or c) resentation ssessment
		nounced in due form ur egulations) 2009.	ider observance of Se	ection 32 Subsection	3 ASPO (general ac	ademic and
Allocat	ion of p	olaces				
Additic	onal inf	ormation				
Worklo	ad					
			_			
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulatio	ns for teaching-degree prog	rammes)		
Anotari	:4h	Nonochurch	184111111	• encounter of A.		
naster's w	ith 1 majo	r Nanostructure Technology	-	• generated 26-Aug-2024 • ex ter (120 ECTS) Nanostrukturted	-	page 57 / 268

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2012) Master's degree (1 major) FOKUS Physics (2012) Master's degree (1 major) FOKUS Physics (2006)

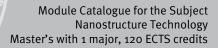
Module	title				Abbreviation
Thermo	dynam	ics and Economics			11-TDOE-141-m01
Module	coord	inator		Module offered by	
Managi and Ast		ector of the Institute of Th iics	eoretical Physics	Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	ıpl. of module(s)	
3	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
Part I de folding of the s ropy pro mic gro Part 2 a econom ve labo and cos cial ten Part 3 in use, an <b>Intende</b> The stu in the w connec mies. TI NOTE: t	escribe of civil econd oductio wth. nalyse ny and ur. Wit sts of p sions. ncludes d intro ed learn dents u vorld's tions b hey are his is t	isation. The entropy prod law of thermodynamics f on and natural resources s how the factors capital determine economic grow hin the current system of roduction factors leads to The course discusses how s seminar presentations, duces the optimisation p <b>hing outcomes</b> understand that energy co economic and social dev etween thermodynamics able to apply the acquire	ersion in the develop luction density of nor or ecological damage define the technolog , work, energy and cri- wth. The productive p taxes and social sec o job cuts, waste of ro- w factor income taxati comprises the techn rogramme deeco (Dy onversion and entrop elopment. As an exter and economy as well ed knowledge to part by Prof. Dr. R. Kümme	ment of the universe n-equilibrium thermo e and resource consu- ical and ecological b eativity produce the power of cheap energ urity contributions, t esources, impoverish tion can counteract t iques of rational energy namic Energy, Emiss oy production are goi ension of economic t ll as the productive p ticular problems. el, who has now retire	rgy use and non-fossil energy ion and Cost Optimization). ng to play an important role heory, the students know the hysical basis of modern econo- ed. As the module was tailored to
Courses	<b>5</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)	
V (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	)
		e <b>ssment</b> (type, scope, langua) le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
in grou weeks)	os (app or d) p	prox. 30 minutes per cano resentation/seminar pre	lidate) or c) project re	eport (approx. 8 to 10	date each or oral examination pages, time to complete: 1 to 4
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
	•				
Worklo	ad				
 Ta!!					
Teachir	ig cycl	e			
Doform	d to in		forteaching		
Relefie		LPOI (examination regulations	or teaching-degree progra	inines)	

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011)

Module	e title				Abbreviation		
Image	and Sig	gnal Processing in Phy	sics		11-BSV-122-m01		
Module	e coord	inator		Module offered by			
Manag	ing Dire	ector of the Institute of	Applied Physics	plied Physics Faculty of Physics and Astronomy			
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
6	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 semester graduate			sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment into	t. Students who mee n the current or in th date, students will h	nts about the respection for the course win ission to assessment r admission to assess will put their registration t all prerequisites with e subsequent semest	ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-	
Conten	ts						
and im convolu- getic of transfo Intende The stu- les of in	age pro ution p bservat rmatio ed lear idents mage p	ocessing; discretisation roduct; tapering function ion; statistical signals n. <b>ning outcomes</b> have advanced knowle rocessing and are fam	iples of discreet and ex n of signals/sampling th ons and interpolation o , image noise, moments dge of digital image an iliar with different meth em, especially in the fie	neorem (Shannon); h f images; the Parsiva s, stationary signals; d signal processing. ods of signal proces	nomogeneous and lin al theorem, correlation tomography: Hanke They know the phys	near filters, on and ener- el and Radon ical princip-	
			s, language — if other than Ger				
			y contact hours) and co		able)		
Metho	d of ass		guage — if other than German, o			on on whether	
(approx d) pres Assess and wil examin	x. 30 m entatio ment o Il be an nation r	inutes per candidate) o n/seminar presentatio ffered: When and how nounced in due form u egulations) 2009.	or b) oral examination ( or c) project report (app n (approx. 30 minutes) often assessment will b nder observance of Sec	rox. 8 to 10 pages, ti pe offered depends o	me to complete: 1 to on the method of ass	6 4 weeks) or	
Allocat	ion of <sub>l</sub>	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	immes)			
Master's w (2010)	ith 1 majo	r Nanostructure Technology	_	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 61 / 268	

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011)

Module	e title				Abbreviation	
Imagin	g Meth	ods at the Synchrotro	n		11-BMS-121-m01	
Module	e coord	inator		Module offered by		
Manag	ing Dire	ector of the Institute of	Applied Physics	lied Physics Faculty of Physics and Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semestergraduateCertain prerequisites must be met sessment. The lecturer will inform at the beginning of the course. Reg sidered a declaration of will to see dents have obtained the qualificat the course of the semester, the lect sessment into effect. Students why ted to assessment in the current o sessment at a later date, students admission to assessment anew.		the course. Registrat n of will to seek adm d the qualification fo mester, the lecturer t. Students who mee n the current or in th date, students will h	nts about the respection for the course win ission to assessment r admission to assess will put their registration t all prerequisites wint e subsequent semest	ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-		
Conten	Its					
ter Pr crystall Intende The stu ciples of als. The	rinciple line ma ed learn udents l of imag ey unde	s of X-ray optics, X-ray terials. ning outcomes have advanced knowle ing techniques at the s erstand the principles of	nd its generation Prind lens Synchroton dete edge of synchrotron radi synchrotron and their ap of image generation and	ation and X-ray optic	diffractometry (diffr cs. They know the ph line materials and of	action) of nysical prin- ther materi-
	nple in		rs, language — if other than Ger	(man)		
			ly contact hours) and co		able)	
Metho	d of ass	· · ·	guage — if other than German,		-	ion on whether
(approx d) pres Assess and wi	x. 30 m entatio ment o ll be an	inutes per candidate) n/seminar presentatic ffered: When and how	or b) oral examination or c) project report (app on (approx. 30 minutes) often assessment will l inder observance of Sec	rox. 8 to 10 pages, ti be offered depends o	me to complete: 1 to on the method of ass	o 4 weeks) or sessment
Allocat	ion of <sub>l</sub>	olaces				
Additio	onal inf	ormation				
	-1					
Worklo	ad					
Teachi	ng cycl	e				
	-					
Referre	ed to in	LPO I (examination regulat	ions for teaching-degree progra	immes)		
		•				
Module	e appea	ars in				
Master's w (2010)	ith 1 majo	r Nanostructure Technology		generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 63 / 268

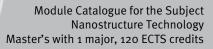


Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

(2010)

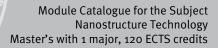
Module	Module title Abbreviation					
Imagin	g Meth	ods at the Synchrotro	n		11-BMS-131-m01	
Module	e coord	inator		Module offered by		
Managi	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics and Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semestergraduateCertain prerequisites must be met to sessment. The lecturer will inform st at the beginning of the course. Regis sidered a declaration of will to seek dents have obtained the qualificatio the course of the semester, the lecture sessment into effect. Students who noted to assessment in the current or integration				rer will inform stude the course. Registrat on of will to seek adm d the qualification fo mester, the lecturer t. Students who mee	nts about the respection for the course winission to assessment admission to assessment admission to assessivill put their registration to assessivill put their registration with all prerequisites with a statement and prerequisites with a statement and statement and statement and statement administer with a statement administer administe	tive details Il be con- nt. If stu- ssment over tion for as- ill be admit-
Conten	ts					
	inciple	s of X-ray optics, X-ray	id its generation Prind lens Synchroton dete	•		
Intende	ed lear	ning outcomes				
ciples o	of imag ey unde	ing techniques at the s erstand the principles o	dge of synchrotron rad synchrotron and their a of image generation and	pplication for crystal	line materials and ot	her materi-
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Ge	rman)		
V + R (n	no infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informati	on on whether
in grou weeks) Assess and wil examin	ps (app or d) p ment o Il be an ation r	prox. 30 minutes per ca resentation/seminar p ffered: When and how	ninutes) or b) oral exam Indidate) or c) project r resentation (approx. 30 often assessment will l nder observance of Seo nglish	eport (approx. 8 to 10 5 minutes) be offered depends o	o pages, time to com on the method of ass	plete: 1 to 4 sessment
Allocat	-					
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)		
Module						
Master	's degr	ee (1 major) Physics (20	010)			
Master's wi (2010)	ith 1 majo	r Nanostructure Technology	-	generated 26-Aug-2024 • ex er (120 ECTS) Nanostrukturtec	_	page 65 / 268

## Julius-Maximilians-UNIVERSITÄT WÜRZBURG



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) FOKUS Physics (2010)

Module	title				Abbreviation	
Image a	and Sig	nal Processing in Phy	sics		11-BSV-131-m01	
Module	e coord	inator		Module offered by		
Managi	ng Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semestergraduateCertain prerequisites must be sessment. The lecturer will at the beginning of the coursidered a declaration of will dents have obtained the que the course of the semester, sessment into effect. Stude ted to assessment in the curse of the semester.			the course. Registrat n of will to seek adm d the qualification fo mester, the lecturer t. Students who mee	nts about the respection for the course winission to assessment r admission to assessment r admission to assest will put their registration t all prerequisites wit	tive details Il be con- nt. If stu- ssment over ition for as- ill be admit-	
Conten	ts					
and ima convolu getic ol	Periodic and aperiodic signals; principles of discreet and exact Fourier transformation; principles of digital signal and image processing; discretisation of signals/sampling theorem (Shannon); homogeneous and linear filters, convolution product; tapering functions and interpolation of images; the Parsival theorem, correlation and ener- getic observation; statistical signals, image noise, moments, stationary signals; tomography: Hankel and Radon transformation.					
Intende	ed learı	ning outcomes				
les of ir ferent r	nage p nethod	rocessing and are fam s and to implement th	dge of digital image an iliar with different meth em, especially in the fie	ods of signal proces eld of tomography.		
Course	<b>S</b> (type, n	umber of weekly contact hour	rs, language — if other than Ger	rman)		
V + R (n	o infor	mation on SWS (week	y contact hours) and co	ourse language avail	able)	
		<b>essment</b> (type, scope, lang le for bonus)	guage — if other than German, o	examination offered — if no	t every semester, informati	on on whether
in grou weeks) Assess and wil examin	ps (app or d) p ment o l be an ation r	prox. 30 minutes per ca resentation/seminar p ffered: When and how	ninutes) or b) oral exam andidate) or c) project re presentation (approx. 30 often assessment will b under observance of Sec anglish	eport (approx. 8 to 10 o minutes) oe offered depends o	o pages, time to com on the method of ass	plete: 1 to 4 sessment
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	e				
Referre	d to in	LPOI (examination regulat	ions for teaching-degree progra	mmes)		
Module	e appea	irs in				
Master's wi (2010)	th 1 majoi	Nanostructure Technology	-	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 67 / 268



Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) FOKUS Physics (2010)

Module	e title				Abbreviation	
Physic	s of Ad	vanced Materials			11-PMM-132-m01	
Module	e coord	inator		Module offered by	<u> </u>	
Manag	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
6	1	rical grade		• • • •		
Duratio		Module level	Other prerequisites			
1 seme		graduate				
Conten		3.44440				
-		erties of various materia	 al groups such as liquid	ds liquid crystals an	d nolymers• magneti	ic materials
and su	percon	ductors; thin films, het imensional layer mater	erostructures and supe			
Intend	ed lear	ning outcomes				
The stu	udents	know the properties an	d characterising metho	ods of some modern	materials.	
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Ge	rman)		
V + R (r	no infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		sessment (type, scope, lang	·			ion on whether
		le for bonus)	,		···· , ··· , · · ··	
in grou weeks) Assess and wi examir	ips (app ) or d) p sment o Il be an nation r	mination (approx. 90 m prox. 30 minutes per ca presentation/seminar p ffered: When and how nounced in due form u egulations) 2009. ssessment: German, E	ndidate) or c) project r resentation (approx. 3 often assessment will nder observance of Se	eport (approx. 8 to 10 5 minutes) be offered depends o	o pages, time to com on the method of ass	nplete: 1 to 4 sessment
	tion of p					
Additio	nal inf	ormation	_			
Worklo						
WOIKIU						
Toochi	ng cycl					
Teacin	ing cyci	e				
			_			
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)		
		•				
	e appea					
1	-	ree (1 major) Physics (2				
	-	ree (1 major) Physics (2 ree (1 major) Nanostruo		)		
	-	ree (1 major) Nanostruc				
	-	ee (1 major) Physics (20		)		
	-	ee (1 major) Physics (20				
	-	ee (1 major) Nanostruct				
	-	ee (1 major) Nanostruct				
	-	ee (1 major) FOKUS Phy				
Master	's degr	ee (1 major) FOKUS Phy	vsics (2011)			
Master's w	ith 1 maio	r Nanostructure Technology	IMU Würzburg	generated 26-Aug-2024 • ex	am, reg. da-	page 69 / 268
(2010)			-	er (120 ECTS) Nanostrukturtec	-	Page 09 / 200

Module	title				Abbreviation	
Quantu	m Info	rmation Technology			11-QUI-132-m01	
Module	coord	inator		Module offered by		
Managi	ng Dire	ector of the Institute of Ap	plied Physics	Faculty of Physics a	nd Astronomy	
ECTS Method of grading Only after s			Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Contents					
Basic c proach	Basic concepts of quantum mechanics, quantum bits and algorithms, quantal measurements, experimental approaches towards quantum computing (on the basis of photons, ions and nuclear spins), quantum operations and quantum noise, quantum information and communication.					
Intende	ed learn	ning outcomes				
	xperim		•	•	information technology. They or the transfer of quantum infor-	
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V + R (n	o infor	mation on SWS (weekly o	contact hours) and co	urse language availa	able)	
module is a) writte in grou weeks) Assess and wil examin Langua Allocat	creditab en exar ps (app or d) p ment o l be an ation ro ge of a ion of p nal info ad	le for bonus) mination (approx. 90 min prox. 30 minutes per cano resentation/seminar pre ffered: When and how off nounced in due form unc egulations) 2009. ssessment: German, Eng places	utes) or b) oral exam didate) or c) project re sentation (approx. 3c ten assessment will b ler observance of Sec	ination of one candi eport (approx. 8 to 10 o minutes) pe offered depends c	t every semester, information on whether date each or oral examination o pages, time to complete: 1 to 4 on the method of assessment 3 ASPO (general academic and	
	d # a . ! m			``````````````````````````````````````		
		LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	annea	rs in				
Master Master Master Master Master	Module appears in 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) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011)					

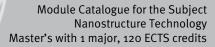


# Solid State Physics and Nanostructures

(24 ECTS credits)

Module	e title				Abbreviation	
Opto-e	lectron	ic Material Properties			11-MOE-092-m01	
Module		instor		Madula offered by	<u> </u>	
			Applied Dhusies	Module offered by	and Astronomy	
	1	ector of the Institute of		Faculty of Physics a	ind Astronomy	
ECTS	1	od of grading	Only after succ. con	npl. of module(s)		
5		rical grade				
Duratio	on	Module level	Other prerequisites	i i i i i i i i i i i i i i i i i i i		
1 semestergraduateAdmission prerequisite to assessment: successful completion of a 50% of exercises. Certain prerequisites must be met to qualify for a sion to assessment. The lecturer will inform students about the res ve details at the beginning of the course. Registration for the course be considered a declaration of will to seek admission to assessment students have obtained the qualification for admission to assessment into effect. Students who meet all prerequisites will be mitted to assessment in the current or in the subsequent semester assessment at a later date, students will have to obtain the qualific for admission to assessment anew.				ify for admis- the respecti- e course will essment. If ssessment gistration for s will be ad- mester. For		
Conten	its			cosment anew.		
		inles of optoelectronic	material properties an	d applications		
-	-	ning outcomes				
				abara staristics		
		· · ·	optoelectronic material			
			rs, language — if other than Ge			
			ly contact hours) and co		· · · · · · · · · · · · · · · · · · ·	
		<b>sessment</b> (type, scope, lan le for bonus)	guage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
groups	(appro report	x. 30 minutes per can (approx. 10 pages, tim	ninutes) or b) oral exam didate, for modules with te to complete: 1 to 4 we	n less than 4 ECTS cr	edits approx. 20 mi	nutes) or c)
Allocat	ion of p	olaces				
Additic	onal inf	ormation				
Worklo	ad					
 Teachi	ng cycl	e				
 Teachi	ng cycl	e				
			ions for teaching-degree progra	ımmes)		
			ions for teaching-degree progra	ımmes)		
 Referre	ed to in	LPOI (examination regulat	ions for teaching-degree progra	ummes)		
 Referre  Module	ed to in e appea	LPO I (examination regulat		ımmes)		
 Referre  Module Bachel	ed to in e appea or' deg	LPOI (examination regulat ars in ree (1 major) Physics (	2010)	ımmes)		
 Referre  Module Bachel Master	ed to in e appea or' deg 's degr	LPO I (examination regulat ars in ree (1 major) Physics ( ee (1 major) Physics (2	2010)			
 Referre  Bachel Master Master	ed to in e appea or' deg 's degro	LPO I (examination regulat ars in ree (1 major) Physics ( ee (1 major) Physics (2 ee (1 major) Technolog	2010) 010)	ls (2010)		
 Referre  Bachel Master Master Master Master	ed to in e appea or' deg 's degru 's degru 's degru 's degru	LPO I (examination regulat ars in ree (1 major) Physics ( ee (1 major) Physics (2 ee (1 major) Technolog ee (1 major) Technolog ee (1 major) Nanostruc	2010) 010) ty of Functional Materia ty of Functional Materia ture Technology (2010)	ls (2010) ls (2009)		
 Referre  Bachel Master Master Master Master	ed to in e appea or' deg 's degru 's degru 's degru 's degru 's degru	LPO I (examination regulat ars in ree (1 major) Physics ( ee (1 major) Physics (2 ee (1 major) Technolog ee (1 major) Technolog ee (1 major) Nanostruc	2010) 010) ty of Functional Materia ty of Functional Materia ture Technology (2010) ysics - Nanostructuring	ls (2010) ls (2009)		





Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) Functional Materials (2012)

Modul	e title				Abbreviation
Visitin	g Resea	arch Project			11-FPA-112-m01
Modul	e coord	inator		Module offered by	, ,
Manag	ging Dir	ector of the Institute of A	oplied Physics	Faculty of Physics	and Astronomy
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade			
Durati	on	Module level	Other prerequisites		
1 seme	ester	graduate	Approval by examin	ation committee red	quired.
Conter	nts				·
tific ex	perime		d documentation of t		Physics. Implementation of scien- lly in the context of research visits
Intend	ed lear	ning outcomes			
		are able to independently analyse scientific experim			erimental or Theoretical Physics, to
Course	es (type, i	number of weekly contact hours,	language — if other than Ge	rman)	
R (no i	nforma	tion on SWS (weekly cont	tact hours) and cours	e language availabl	e)
		S <b>essment</b> (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if n	ot every semester, information on whether
		(approx. 10 to 20 pages) issessment: German, Eng			
Alloca	tion of	places			
Additi	onal inf	ormation			
Additio	onal inf	ormation on module dura	ation: 1 to 2 semester	·S.	
Workle	oad				
Teachi	ing cycl	e			
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	ummes)	
Modul	e appea	ars in			
		ee (1 major) Physics (201	o)		
Maste	r's degr	ee (1 major) Physics (201	1)		
	-	ee (1 major) Nanostructu	•, •		
Maste	r's degr	ee (1 major) Nanostructu	re Technology (2010)		

Module title					Abbreviation		
Applie	Applied Superconduction				11-ASL-092-m01		
Module	e coord	inator		Module offered by			
Manag	ing Dire	ector of the Institute of	Applied Physics	pplied Physics Faculty of Physics and Astronomy			
ECTS	Methe	od of grading	Only after succ. con	npl. of module(s)			
6	nume	rical grade					
Duratio	on	Module level	Other prerequisites	i			
1 semester		graduate	sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the set sessment into effect ted to assessment i sessment at a later	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	nts						
			vity. Application in ene alculation of temperatu			ents. Me-	
Intend	ed lear	ning outcomes					
are abl able to energy	e to ev discus techno	aluate the contribution s questions on superc logy. Furthermore, the	nding of superconductiv s of materials sciences onductivity in a scientif y can deal with practica rs, language — if other than Ge	to the development ic manner and to crit al mathematical ques	of superconductivity ically question deve	y. They are	
R + V (r	no infoi	mation on SWS (week	y contact hours) and co	ourse language avail	able)		
		<b>Sessment</b> (type, scope, lang Ile for bonus)	guage — if other than German,	examination offered — if no	t every semester, informati	on on whether	
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (ap- prox. 30 minutes) Assessment offered: once a year, winter semester Language of assessment: German, English						ninutes) or	
Allocat	tion of <sub>l</sub>	olaces					
Additio	onal inf	ormation					
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
	e appea						
Bachel	or' deg	ree (1 major) Physics (2	2010)				
Master's w (2010)	ith 1 majo	r Nanostructure Technology		generated 26-Aug-2024 • ex er (120 ECTS) Nanostrukturtec		page 75 / 268	

Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

Module title					Abbreviation	
Semico	onducto	or Lasers - Principles and	Current Research		11-HLF-092-m01	
Modul	e coord	inator		Module offered by		
Manag	ing Dire	ector of the Institute of A	pplied Physics	Faculty of Physics a	and Astronomy	
ECTS						
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester		graduate	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective detai 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 ov the course of the semester, the lecturer will put their registration for as sessment into effect. Students who meet all prerequisites will be admi 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 admission to assessment anew.		nts about the respective details ion for the course will be con- nission to assessment. If stu- r admission to assessment over will put their registration for as- et all prerequisites will be admit- e subsequent semester. For as-	
rent de	cture di evelopn	nents regarding compone	ents. The principles of	f lasers are describe	semiconductor lasers, and cur- d on the basis of a general laser Basic concepts such as thres-	
hold co riers ar des, la ductor	ondition nd phot ser reso lasers.	n, characteristic curve an cons. Other topics of the l onators, mode selection,	d laser efficiency are lecture are optical pro dynamic properties a current topics of laser	derived from couple ocesses in semicond as well as technolog	d rate equations for charge car- luctors, layer and ridge wavegui- y for the generation of semicon- lantum dot lasers, quantum cas-	
Intend	ed lear	ning outcomes				
		have advanced knowledg modern questions and k			er physics. They can apply their opment of components.	
Course	<b>S</b> (type, r	number of weekly contact hours,	language — if other than Ger	rman)		
R + V (I	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
			age — if other than German, e	examination offered — if no	ot every semester, information on whether	
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						
Allocat	tion of p	places				
Additional information						
 Worklo	oad					

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

<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)				
Module appears in				
Bachelor' degree (1 major) Physics (2010)				
Bachelor' degree (1 major) Physics (2012)				
Bachelor' degree (1 major) Nanostructure Technology (2010)				
Bachelor' degree (1 major) Nanostructure Technology (2012)				
Master's degree (1 major) Mathematics (2012)				
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) FOKUS Physics - Nanostructuring Technology (2010)				
Master's degree (1 major) FOKUS Physics (2010)				
Master's degree (1 major) FOKUS Physics (2011)				
Master's degree (1 major) Computational Mathematics (2012)				
Master's degree (1 major) Functional Materials (2012)				

Module title Abbreviation					
Applied	d Semi	conductor Physics			11-AHL-092-m01
Module coordinator				Module offered by	
Manag	ing Dir	ector of the Institute of Ap	oplied Physics	Faculty of Physics a	and Astronomy
ECTS	Meth	od of grading	Only after succ. com	pl. of module(s)	
6	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 semester		graduate	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective detail 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 ov 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		ints 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	tc		admission to assess	sment anew.	
		scusses the principles of	Semiconductor Phys	ics and provides an	exemplary overview of the main
		of electronics, optoelectro		•	
Intende	ed lear	ning outcomes			
phonon band structures of important semiconductors and the resulting electronic, optical and thermal proper- ties. They know the principles of charge transport as well as the Poisson, Boltzmann and continuity equation for the solution of questions. They have gained insights into the methods of semiconductor production and are fa- miliar with the theories of planar technology and recent developments in this field, they have a basic understan- ding of component production. They understand the structure and way of functioning of the main components of electronics (diode, transistor, field-effect transistor, thyristor, diac, triac), of microwave applications (tunnel, Im- patt, Baritt or Gunn diode) and of optoelectronics (photo diode, solar cell, light-emitting diode, semiconductor injection laser), they know the realisation possibilities of low-dimensional charge carrier systems on the basis of semiconductors and their technological relevance, they are familiar with current developments in the field of					
compo Course		number of weekly contact hours, l	anguage — if other than Ger	man)	
		rmation on SWS (weekly o			able)
		s <b>essment</b> (type, scope, langua ble for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English					
Allocat	ion of	places			
Additio	nal inf	ormation			

#### Workload

Teaching cycle

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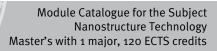
Referred to in LPO I (examination regulations for teaching-degree programmes)

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## Module appears in

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

Module title					Abbreviation		
Solid S	tate Ph	lysics 2			11-FK2-092-m01		
Module	e coord	inator		Module offered by			
Manag	ing Dire	ector of the Institute of A	Applied Physics	plied Physics Faculty of Physics and Astronomy			
ECTS	Metho	od of grading	Only after succ. con	Only after succ. compl. of module(s)			
8	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 semester graduate		graduate	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						
cal mo	del. Die	id-State Physics. Electro electric properties and fo optical properties [option	erroelectrics. Semicon				
		ning outcomes					
The stu	idents l	have specific and advar e in a sub-discipline of		field of Solid-State F	Physics. They are theo	oretically ab-	
		umber of weekly contact hours		man)			
R + V (r	no infor	mation on SWS (weekly	contact hours) and co	ourse language availa	able)		
		<b>sessment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informatio	n on whether	
groups project (approz Assess and wil examin	(appro report x. 30 m ment o Il be an nation r	mination (approx. 90 m x. 30 minutes per cand (approx. 8 to 10 pages, inutes) ffered: When and how o nounced in due form u egulations) 2009. ssessment: German, Er	idate, for modules with time to complete: 1 to often assessment will h nder observance of Sec	n less than 4 ECTS cr 4 weeks) or d) prese pe offered depends c	edits approx. 20 minu entation/seminar pres	utes) or c) sentation essment	
Allocat			-				
	•	-					
Additio	onal info	ormation					
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
 Module appears in							
mouule	e ahheg	u 5 III					
Master's w (2010)	ith 1 majoı	r Nanostructure Technology		generated 26-Aug-2024 • exa r (120 ECTS) Nanostrukturtec	-	page 81 / 268	

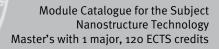


ſ	Bachelor' degree (1 major) Physics (2010)
	Bachelor' degree (1 major) Physics (2012)
	Master's degree (1 major) Mathematics (2012)
	Master's degree (1 major) Mathematics (2010)
	Master's degree (1 major) Physics (2010)
	Master's degree (1 major) Physics (2011)
	Master's degree (1 major) Nanostructure Technology (2011)
	Master's degree (1 major) Nanostructure Technology (2010)
	Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)
	Master's degree (1 major) FOKUS Physics (2010)
	Master's degree (1 major) FOKUS Physics (2011)
	Master's degree (1 major) Computational Mathematics (2012)

Module title					Abbreviation	
Solid S	tate Sp	ectroscopy			11-FKS-092-m01	
Module	coord	inator		Module offered by		
Managi	ng Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy	
ECTS Method of grading			Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semester graduate		sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the set sessment into effect ted to assessment in sessment at a later	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					
-		any-particle picture of X-ray spectroscopies.	electrons in solids. Ligh	nt-matter interaction.	. Optical spectroscop	oy. Electron
Intende	ed learı	ning outcomes				
types o	f spect		nced knowledge in the s of application. They u			
Course	<b>S</b> (type, n	umber of weekly contact hour	s, language — if other than Ge	rman)		
R + V (n	o infor	mation on SWS (weekl	y contact hours) and co	ourse language availa	able)	
		<b>essment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						nutes) or c) esentation sessment
Allocat	-		<u> </u>			
Additional information						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
 Module appears in						
module	appea	115 III				
Master's wi (2010)	th 1 majoı	Nanostructure Technology		generated 26-Aug-2024 • exercise exercise exercises (120 ECTS) Nanostrukturtec	-	page 83 / 268

Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Nanostructure Technology (2012)
Master's degree (1 major) Mathematics (2012)
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) FOKUS Physics - Nanostructuring Technology (2010)
Master's degree (1 major) FOKUS Physics (2010)
Master's degree (1 major) FOKUS Physics (2011)
Master's degree (1 major) Computational Mathematics (2012)

Module title					Abbreviation	
Transp	ort Phe	enomena in Solids			11-FKT-092-m01	
Module	e coord	linator		Module offered by		
Manag and As	-	ector of the Institute of sics	Theoretical Physics	Faculty of Physics a	nd Astronomy	
ECTS	<u> </u>	od of grading	Only after succ. con	pl. of module(s)		
6	nume	rical grade				
Duratio	on .	Module level	Other prerequisites			
1 semester graduate		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	its	•				
Transp	ort phe	nomena in solids.				
Intende	ed lear	ning outcomes				
The stu	Idents	have specific and adva	inced knowledge in the	field of transport ph	enomena in solids.	
Course	<b>S</b> (type, 1	number of weekly contact hou	rs, language — if other than Gei	rman)		
R + V (r	no info	rmation on SWS (week	ly contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, lang ble for bonus)	guage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
groups project (approx Assess and wil examin Langua	a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English					
Allocat	ion of	places				
 Additio	onal inf	ormation				
 Worklo	ad					
WORKIO	du					
Teachi		٩				
	is cycl	G				
Referre	d to in	<b>IPOI</b> (examination regulation	ions for teaching-degree progra	mmec)		
Module	e anne:	ars in				
Bachel	or' deg	ree (1 major) Physics (2 ree (1 major) Physics (2				
Master's w (2010)	ith 1 majo	r Nanostructure Technology		generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 85 / 268



Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

Module title					Abbreviation		
Semico	onducto	or Physics			11-HLP-092-m01		
Module	e coord	inator		Module offered by			
Manag	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
6	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
		graduate	sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the set sessment into effect ted to assessment in sessment at a later	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						
ons and sation	d their effects <b>ed lear</b>	coupling effects. Electron of semiconductors wit	nding and the electroni ron-phonon coupling. T h reduced dimensions. nced knowledge in the	emperature-depende (Semi-)magnetic ser	ent transport proper niconductors.	ties. Quanti-	
	nciples		I have gained an overvi				
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Ge	rman)			
			y contact hours) and co				
		<b>sessment</b> (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informat	ion on whether	
groups project (approz Assess and wil examin	<ul> <li>a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes)</li> <li>Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.</li> <li>Language of assessment: German, English</li> </ul>						
Allocat	ion of <sub>l</sub>	olaces					
Additional information							
Workload							
Teaching cycle							
Referre	<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)						
Master's w (2010)	ith 1 majo	r Nanostructure Technology	-	generated 26-Aug-2024 • exa r (120 ECTS) Nanostrukturtec	-	page 87 / 268	



# Module appears in

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2012) Master's degree (1 major) Mathematics (2012) 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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2012)

Module title		Abbreviation				
Semiconductor Nanostructures 11-HNS-092-m01						
Module coord	Module coordinator			Module offered by		
Managing Dire	ector of the Institute of A	pplied Physics	Faculty of Physics a	nd Astronomy		
ECTS Metho	od of grading	Only after succ. com	Only after succ. compl. of module(s)			
6 nume	rical grade					
Duration	Module level	Other prerequisites				
1 semester graduate		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	L	,				
or macroscopi ging their size tures of varyin with a focus o of novel optoe for quantum c	ic crystals, their electron . The lecture addresses to g dimensions (2D, 1D, o n optical properties and electronic and quantum p ommunication and quan	ic, optical and magne echnological challen D). It provides the bas light-matter coupling photonic devices base	tic properties can be ges in the preparatio sic theoretical conce . Moreover, it discus ed on such nanostrue	. In contrast to atoms, molecules e systematically tailored by chan- on of semiconductor nanostruc- pts to describe their properties, ses the challenges and concepts ctures, including building blocks		
Intended lear	ning outcomes					
knowledge of		ds to fabricate such s	tructures, and of the	tor nanostructures. They have eir applications to novel photonic arch.		
Courses (type, r	number of weekly contact hours,	language — if other than Ger	man)			
R + V (no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)		
Method of ass module is creditab		age — if other than German, e	examination offered — if no	t every semester, information on whether		
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						
Allocation of p	Allocation of places					
Additional inf	ormation					
Workload						

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

Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Bachelor' degree (1 major) Physics (2010)					
Bachelor' degree (1 major) Physics (2012)					
Bachelor' degree (1 major) Nanostructure Technology (2010)					
Bachelor' degree (1 major) Nanostructure Technology (2012)					
Master's degree (1 major) Mathematics (2012)					
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) Technology of Functional Materials (2010)					
Master's degree (1 major) Nanostructure Technology (2011)					
Master's degree (1 major) Nanostructure Technology (2010)					
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)					
Master's degree (1 major) FOKUS Physics (2010)					
Master's degree (1 major) FOKUS Physics (2011)					
Master's degree (1 major) Computational Mathematics (2012)					
Master's degree (1 major) Functional Materials (2012)					

Module	title				Abbreviation	
Lithogr	aphy ii	n Semiconductor Techr	nology and Theory of Q	uantum Transport	11-LHQ-092-m01	
Module	coord	inator		Module offered by		
Managi	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
6		rical grade		•		
Duratio	n	Module level	Other prerequisites			
1 semester graduate		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		•			
Introdu	ction to	o the lithographic tech ransport.	niques of semiconduct	or technology and di	scussion of the requ	uired theory
Intende	ed lear	ning outcomes				
The stu transpo		have specific and adva	nced knowledge of sen	niconductor lithogra	phy and of the theor	y of quantum
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
R + V (n	io infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
groups project (approx Assess and wil examin	(appro report <. 30 m ment o l be an ation r	x. 30 minutes per canc (approx. 8 to 10 pages inutes) ffered: When and how	ninutes) or b) oral exam lidate, for modules with , time to complete: 1 to often assessment will h nder observance of Seo nglish	n less than 4 ECTS cr 4 weeks) or d) prese be offered depends o	redits approx. 20 min entation/seminar pro on the method of as:	nutes) or c) esentation sessment
Allocat	-					
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	ummes)		
Module						
Bachelo	or' deg	ree (1 major) Physics (2	2010)			
Master's wi (2010)	th 1 majo	r Nanostructure Technology		generated 26-Aug-2024 • ex er (120 ECTS) Nanostrukturtec	-	page 91 / 268

Bachelor' degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

Module	title				Abbreviation	
Magnet	tism				11-MAG-092-m01	
Module	coord	inator		Module offered by		
Managi	ng Dire	ector of the Institute of A	pplied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semester graduate		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					
		nagnetism, exchange in gnetism, superparamagn		_		
Intende	ed learr	ning outcomes				
experin ches ar	nents; I nd are a	know basic terms, conce they are skilled in simple able to apply them to tas of these areas; they are a	e model building and i ks in the stated areas	in the formulation of ; they have compete	mathematical-physencies in independe	ical approa-
Course	<b>S</b> (type, n	umber of weekly contact hours,	language — if other than Ger	man)		
R + V (n	o infor	mation on SWS (weekly	contact hours) and co	urse language availa	able)	
		e <b>essment</b> (type, scope, langua le for bonus)	age — if other than German, e	examination offered — if no	t every semester, informat	ion on whether
groups project (approx Assessi and wil examin	a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English					nutes) or c) esentation sessment
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
Teachir	ng cycl	e				
<u>-</u>						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
Master's wi (2010)	th 1 major	Nanostructure Technology	-	generated 26-Aug-2024 • exa r (120 ECTS) Nanostrukturtecl	-	page 93 / 268

# Module appears in

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010)

Module	Nodule title				Abbreviation	
Magne	Agnetism and Spin Transport				11-MST-092-m01	
Module	e coord	inator		Module offered by		
Manag	ing Dire	ector of the Institute of Ap	plied Physics	Faculty of Physics a	ind Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
2 semester graduate		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	its		L			
to char tallic sy tion in rent-ing Intende The stu tic expe	The module spans two semesters. During the winter semester, the students become acquainted with the princip- les of magnetism (ranging from atoms to solids), properties of magnetic material (individual usage) and methods to characterise magnetic properties. During the summer semester, the students learn about spin transport in me- tallic systems in due consideration of giant magnetoresistance and tunnel magnetoresistance and its applica- tion in magnetic memory. As a last point, we discuss new phenomena from the field of spin dynamics and cur- rent-induced spin phenomena. Intended learning outcomes The students know the basic terms, concepts and phenomena of magnetism and measuring methods for magne- tic experiments; they are familiar with spin transport applications of information technologies and have gained an overview of modern findings in this area (GMR, TMR). They are skilled in simple model building and in the for-					
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V + R +	V (no i	nformation on SWS (weel	kly contact hours) and	d course language a	vailable)	
		<b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
groups project (approz Assess and wil examin Langua	a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English					
Allocat	Allocation of places					
	Additional information					
Additio	onal info	ormation				
Worklo	Dad					

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

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Module appears in

Bachelor' degree (1 major) Physics (2010)

Bachelor' degree (1 major) Physics (2012)

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

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

Master's degree (1 major) Nanostructure Technology (2010)

Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)

Master's degree (1 major) FOKUS Physics (2010)

Module	Module title				Abbreviation	
Nanoar	nalytics	5			11-NAN-092-m01	
Module	e coord	inator		Module offered by		
Managi	ing Dire	ector of the Institute of Ap	oplied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semester graduate		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					
level up of X-ray py. Sca croscop ray abs Intende The stu vel. The	Principles of analytic procedures in the field of nanostructure physics, imaging techniques from a microscopic level up to an atomic level, examination of chemical composition, spectroscopy of electronic properties, usage of X-ray methods Physics and material systems on the nanoscale Scanning probes: Atomic force microsco- py. Scanning tunneling microscopy Electron probes: Scanning electron microscope. Transmission electron mi- croscope Secondary ions - mass spectrometry - X-ray methods: Synchrotron spectroscopy. Photoemission. X- ray absorption Intended learning outcomes The students have basic knowledge of modern research methods for different nanostructures up to an atomic le- vel. They know microscoping procedures that are used in practice in labs and the industry as well as spectrosco- pic methods for the determination of electronic properties. They are able to evaluate the efficiency of different re-					
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
R + V (n	o infor	mation on SWS (weekly o	contact hours) and co	urse language avail	able)	
module is	creditab	le for bonus)			t every semester, information on whether	
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						
Allocat	ion of p	olaces				
Additio	Additional information					
Worklo	ad					

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Referred to in LPO I (examination regulations for teaching-degree programmes)				
Module appears in				
Bachelor' degree (1 major) Physics (2010)				
Bachelor' degree (1 major) Physics (2012)				
Bachelor' degree (1 major) Nanostructure Technology (2010)				
Bachelor' degree (1 major) Nanostructure Technology (2012)				
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) FOKUS Physics - Nanostructuring Technology (2010)				
Master's degree (1 major) FOKUS Physics (2010)				
Master's degree (1 major) FOKUS Physics (2011)				
Master's degree (1 major) Functional Materials (2012)				

Modul	e title				Abbreviation	
Low-Di	mensio	onal Structures			11-NDS-092-m01	
Modul	e coord	inator		Module offered by		
Manag	ing Dire	ector of the Institute of	Applied Physics	plied Physics Faculty of Physics and Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
		graduate	sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	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		
Conter	its					
	uctures		lattice symmetry. Lattic these structures and v			
Intend	ed lear	ning outcomes				
odes. T evalua dimens band s familia free ele tor and	know methods of producing and analysing such structures. They know the bandstructures of the most important semiconductors as well as the fabrication and characteristics of semiconductor heterostructures and MOS-diodes. They are familiar with the subband structure of semiconductor heterostructures and MOS-diodes and can evaluate the importance of many-particle effects. They are able to solve problems related to potentials in one dimension by applying Poisson's equation. They know the k*p perturbation theory and can deduce the 2D subband structure from the bulk band structure. They have knowledge of the meaning of modulation doping and are familiar with the 2D hydrogen atom. They understand how an external magnetic field acts on the properties of a free electron gas in 2D. They have basic knowledge of the meaning of gauging, Landau-quantisation, filling factor, and are able to solve implicit problems via numerical methods. They are familiar with elementary excitations in					
			rs, language — if other than Ge	rman)		
-			ly contact hours) and co		able)	
		<b>eessment</b> (type, scope, lan le for bonus)	guage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
groups project (appro Assess and wi examir	(appro report x. 30 m ment o Il be an nation r	x. 30 minutes per can (approx. 8 to 10 pages inutes) ffered: When and how	ninutes) or b) oral exam didate, for modules with 5, time to complete: 1 to often assessment will under observance of Sec English	n less than 4 ECTS cr 4 weeks) or d) prese be offered depends o	edits approx. 20 mir entation/seminar pre on the method of ass	nutes) or c) esentation sessment
Allocat	ion of <sub>l</sub>	olaces				
Additio	onal inf	ormation				
Master's w (2010)	ith 1 majo	r Nanostructure Technology	-	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 99 / 268

### 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) Physics (2010) Bachelor' degree (1 major) Physics (2012) 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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010)

Module	e title				Abbreviation	
Nanoel	ectroni	cs			11-NEL-092-m01	
Module coordinator				Module offered by		
Managi	ing Dire	ector of the Institute of Ap	oplied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semester graduate		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		Į.			
discuss Afterwa functio of nanc the ope Intende The stu ons and Course R + V (n Method module is a) writte	The lecture and the corresponding exercises convey basic concepts of electronics of nanostructures. First, we discuss terms such as Fermi distribution, density of states and carrier concentration in view of small structures. Afterwards, we talk about application potentials of nanostructures in electronics. We examine the limits of the function of common switches and storages through miniaturisation and compare them to electronic properties of nanostructures. We gain an overview of nanoelectric amplifiers, rectifier, logic lattices and circuits and discuss the operating principle of quantum computers. Intended learning outcomes The students have mastered the basics of electronics of nanostructures in theory and practice. They know functions and applications of respective components. Courses (type, number of weekly contact hours, language – if other than German) R + V (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in					
groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						
Allocation of places						
Additio	Additional information					
 Workle						
workto	Workload					
Teachir	ng cycl	9				
	Teaching cycle					
L						

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

### Module appears in

Bachelor' degree (1 major) Physics (2010)

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

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

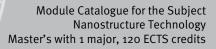
Master's degree (1 major) Nanostructure Technology (2010)

Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)

Master's degree (1 major) FOKUS Physics (2010)

(2010)

Module title					Abbreviation	
Nano-C	Optics				11-NOP-092-m01	
Module	e coord	inator		Module offered by		
Manag	ing Dire	ector of the Institute of	Applied Physics	pplied Physics Faculty of Physics and Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i		
1 semester graduate		sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	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	Its					
			ight. Microscopy. Optic nano-tailored environn			y. Single
Intende	ed lear	ning outcomes				
			nced knowledge in the as of nano-optics and			th the theo-
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Ge	rman)		
R + V (r	no infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
groups project (approx Assess and wil examin	a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English					
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
	-					
Teachi	ng cycl	е				
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)		
Module						
Bachel	or' deg	ree (1 major) Physics (2	2010)			
Master's w (2010)	ith 1 majo	r Nanostructure Technology	-	generated 26-Aug-2024 • ex er (120 ECTS) Nanostrukturtec	-	page 103 / 268

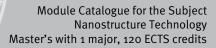


Bachelor' degree (1 major) Physics (2012) Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010)

Module	e title				Abbreviation	
Quantu	um Meo	hanics II			11-QM2-092-m01	
Module	e coord	inator		Module offered by		
Manag and As	•	ector of the Institute of sics	Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	<u> </u>	od of grading	Only after succ. con	pl. of module(s)		
8		rical grade		•		
Duratio	on	Module level	Other prerequisites			
1 semester undergraduate		sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	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	nts	<u> </u>				
<ul> <li>should include:</li> <li>1. Second quantisation: Fermions and bosons</li> <li>2. Band structures of particles in a crystal</li> <li>3. Angular momentum, symmetry operators, Lie Algebras</li> <li>4. Scattering theory: Potential scattering, partial wave expansion</li> <li>5. Relativistic quantum mechanics: Klein-Gordon equation, Dirac equation, Loretz group, fine structure splitting of atomic spectra</li> <li>6. Quantum entanglement</li> </ul>						
		ormalism ning outcomes				
The stu of the r modern thods a	udents mathen n theor and to i	acquire in-depth know natical and theoretical etical Quantum Physic nterpret the results ph	ledge of advanced quar concepts of the listed t s mathematically, to so ysically. The course is p I Matter/Solid-State Phy	opics. They are able lve problems analyti vivotal to subsequen	to describe or mod cally, to use approx t theory courses in	el problems of kimation me- Astrophysics,
Course	<b>S</b> (type, 1	number of weekly contact hou	rs, language — if other than Gei	rman)		
R + V (r	no info	mation on SWS (week	ly contact hours) and co	ourse language avail	able)	
		<b>Sessment</b> (type, scope, lan ole for bonus)	guage — if other than German,	examination offered — if no	ot every semester, informa	tion on whether
groups project	i (appro t report x. 30 m	ox. 30 minutes per can (approx. 8 to 10 pages inutes)	ninutes) or b) oral exam didate, for modules with t, time to complete: 1 to	n less than 4 ECTS cr 4 weeks) or d) prese	edits approx. 20 mi entation/seminar p	inutes) or c)
Assess and will examin	ll be an nation r		under observance of Sec		on the method of as 3 ASPO (general aca	
Assess and wil examir Langua	ll be an nation r age of a	nounced in due form ι egulations) 2009.	Inder observance of Sec Inglish		3 ASPO (general aca	

Allocation of places
Additional information
Workload
Teaching cycle
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)
Module appears in
Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Nanostructure Technology (2012)
Bachelor' degree (1 major) Mathematical Physics (2009)
Bachelor' degree (1 major) Mathematical Physics (2012)
Master's degree (1 major) Mathematics (2012)
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) Mathematical Physics (2012)
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)
Master's degree (1 major) FOKUS Physics (2010)
Master's degree (1 major) FOKUS Physics (2011)
Master's degree (1 major) Computational Mathematics (2012)

Module	e title				Abbreviation	
Quantu	m Phe	nomena in electronic co	orrelated Materials		11-QPM-092-m01	
Module	coord	inator		Module offered by	<u> </u>	
		ector of the Institute of A	Applied Physics	Faculty of Physics and Astronomy		
ECTS		od of grading	Only after succ. con		,	
6		rical grade				
Duratio		Module level	Other prerequisites			
1 semester graduate		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		·			
		cts and phenomena in c lated systems	current solid-state rese	arch. Correlations. F	ree electron gas and	l Fermi liquid.
Intende	ed learı	ning outcomes				
quantu retical o	m effeo descrip	nave specific, advanced ts in strongly correlated tion of such systems ar umber of weekly contact hours	d systems. They are ab ad the current experim	le to understand the ental results.		
		mation on SWS (weekly			able)	
Method	d of ass	essment (type, scope, langu			•	ion on whether
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.						
Allocat	.=	ssessment: German, En <b>Jlaces</b>	<u> </u>			
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
 Module appears in						
		Nanostructure Technology	-	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 107 / 268



Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) 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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010)

Module title Abbreviation					Abbreviation	
Many E	Body Q	uantum Theory			11-QVTP-092-m01	
Module		inator		Madula offered by		
		ector of the Institute of Th	poorotical Physics	Module offered by Faculty of Physics a	and Actronomy	
and As			leoretical Physics		and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
8	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester graduate		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	4	<u> </u>	admission to assess	Smem anew.		
2 Revie 3 Diagr 4 Diagr 5 Land 6 Supe	ew of se rammat rammat au theo ercondu	cle Green's function econd quantization cic method using many pa cic method for finite T ory of Fermi liquids activity ional systems and bosor		ons at temperature T	=0	
Intend	ed lear	ning outcomes				
		have mastered the princi ed methods to current pr			ticle systems. They are able to ap- 5.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)		
R + V (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		s <b>essment</b> (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
groups project (approz Assess and wil examin Langua	(appro report x. 30 m ment o Il be an nation r age of a	ox. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of nounced in due form und egulations) 2009. Issessment: German, Eng	late, for modules with ime to complete: 1 to ten assessment will h der observance of Sec	n less than 4 ECTS cr 4 weeks) or d) prese pe offered depends o	idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment 3 ASPO (general academic and	
Allocat	Allocation of places					
Additio	onal inf	ormation				

#### Workload

Teaching cycle

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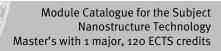
Referred to in LPO I (examination regulations for teaching-degree programmes)

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#### Module appears in

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012) 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) Mathematical Physics (2012) Master's degree (1 major) Mathematical Physics (2012) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010)

Module	e title				Abbreviation		
Relativ	istic Ef	fects in Mesoscopic Sy	stems		11-RMS-092-m01		
Module	e coord	linator		Module offered by	l		
Manag	Managing Director of the Institute of Theoretical Physics and Astrophysics			Faculty of Physics a	and Astronomy		
ECTS		od of grading	Only after succ. con	npl. of module(s)			
5	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 semester graduate		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	its						
		fects in mesoscopic sys tors Majorana fermior		oling Dirac equatio	n Quantum Hall ef	fect Topo-	
Intend	ed lear	ning outcomes					
		have mastered the mat he field of mesoscopic		-	-	•	
		number of weekly contact hours	<u> </u>				
R + V (r	no info	rmation on SWS (weekly	/ contact hours) and co	ourse language avail	able)		
		<b>sessment</b> (type, scope, lang ble for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informati	on on whether	
groups project (approz Assess and wil examir	(appro report x. 30 m ment o Il be ar nation r	mination (approx. 90 m ox. 30 minutes per cand (approx. 8 to 10 pages, inutes) offered: When and how mounced in due form u regulations) 2009.	idate, for modules with time to complete: 1 to often assessment will nder observance of Se	n less than 4 ECTS cr 4 weeks) or d) prese be offered depends o	edits approx. 20 mir entation/seminar pre on the method of ass	nutes) or c) esentation sessment	
Allocat	ion of	places					
Additio	onal inf	ormation					
Workload							
			_				
Teachi	ng cycl	e					
	ea to in	LPO I (examination regulation	ons for teaching-degree progra	immes)			
 Module	e appea	ars in					
	Naster's with 1 major Nanostructure Technology     JMU Würzburg • generated 26-Aug-2024 • exam. reg. da- ta record Master (120 ECTS) Nanostrukturtechnik - 2010     page 111 / 268						



Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Mathematical Physics (2009)
Bachelor' degree (1 major) Mathematical Physics (2012)
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) Mathematical Physics (2012)
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)
Master's degree (1 major) FOKUS Physics (2010)
Master's degree (1 major) FOKUS Physics (2011)

Module	Module title				Abbreviation		
Theoret	Theoretical Solid State Physics				11-TFK-092-m01		
Module	coord	inator		Module offered by			
Managi and Ast	-	ector of the Institute of ics	Theoretical Physics	Faculty of Physics a	nd 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 graduate		sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment into	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				
Content	ts						
		heoretical Solid-State F ism. Superconductivity		eory. Electron-electro	on interaction. Varia	tional me-	
		ning outcomes					
respond theory a	ding mand to	nave basic knowledge of athematical or theoretion understand the connection opic of solid-state theoretic	cal methods and are al tions to experimental r	ole to apply them to results. The individua	basic problems of sc al students have elal	olid-state	
Courses	<b>5</b> (type, n	umber of weekly contact hours	s, language — if other than Ger	rman)			
R + V (n	o infor	mation on SWS (weekly	/ contact hours) and co	ourse language availa	able)		
		<b>essment</b> (type, scope, lang le for bonus)	uage — if other than German, o	examination offered — if no	t every semester, informati	on on whether	
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English							
Allocation of places							
Additional information							
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
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Master's wii (2010)	un 1 major	Nanostructure Technology	-	generated 26-Aug-2024 • exa r (120 ECTS) Nanostrukturtecl	-	page 113 / 268	



Bachelor' o	degree (1 major) Physics (2010)
Bachelor' o	degree (1 major) Physics (2012)
Bachelor' o	degree (1 major) Mathematical Physics (2009)
Bachelor' o	degree (1 major) Mathematical Physics (2012)
Master's d	egree (1 major) Mathematics (2012)
Master's d	egree (1 major) Mathematics (2010)
Master's d	egree (1 major) Physics (2010)
Master's d	egree (1 major) Physics (2011)
Master's d	egree (1 major) Nanostructure Technology (2011)
Master's d	egree (1 major) Nanostructure Technology (2010)
Master's d	egree (1 major) Mathematical Physics (2012)
Master's d	egree (1 major) FOKUS Physics - Nanostructuring Technology (2010)
Master's d	egree (1 major) FOKUS Physics (2010)
Master's d	egree (1 major) FOKUS Physics (2011)
Master's d	egree (1 major) Computational Mathematics (2012)

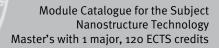
Module	e title				Abbreviation	
Theory	of Sup	erconduction			11-TSL-092-m01	
Module	e coord	inator		Module offered by	<u>.</u>	
Manag and As	-	ector of the Institute of Th sics	neoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester graduate		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					
elemen Intende The stu the pro	nts. <b>ed lear</b> Idents l perties	ning outcomes have basic knowledge of	the theoretical mode	els for the description	computing with superconductive n of superconductivity. They know ulation methods to simple pro-	
blems.			if a then then Ca			
		number of weekly contact hours, I mation on SWS (weekly o			ahla)	
Metho	d of ass				ot every semester, information on whether	
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						
Allocation of places						
Additional information						
Worklo	Workload					
Teaching cycle						

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

#### Module appears in

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012) Master's degree (1 major) Mathematics (2012) 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) Mathematical Physics (2012) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010)	
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Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Mathematical Physics (2012) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011)	Master's degree (1 major) Physics (2010)
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Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011)	Master's degree (1 major) Mathematical Physics (2012)
Master's degree (1 major) FOKUS Physics (2011)	Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)
	Master's degree (1 major) FOKUS Physics (2010)
Master's degree (1 major) Computational Mathematics (2012)	Master's degree (1 major) FOKUS Physics (2011)
	Master's degree (1 major) Computational Mathematics (2012)

Modul	e title				Abbreviation	
Renorm	nalizat	ion Group Methods in F	ield Theory		11-RMFT-102-m01	_
Module	e coord	inator		Module offered by		
	Managing Director of the Institute of Theoretical Physics and Astrophysics			Faculty of Physics a	ind Astronomy	
ECTS	<u>г і і</u>	od of grading	Only after succ. con	pl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester graduate		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	its					
		on group methods for n aviour of cryogenic tem		ential equations, fiel	ld theoretical contex	ts and non-
Intend	ed lear	ning outcomes				
		gain an overview of non alisation group method		ifferential equations	and their solution o	n the basis
		number of weekly contact hours		rman)		
V + R (r	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, lang ole for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
groups project (approj Assess and wi examir	(appro report x. 30 m ment o Il be an nation r	mination (approx. 90 m ox. 30 minutes per cand (approx. 8 to 10 pages, inutes) ffered: When and how o nounced in due form u egulations) 2009. ssessment: German, Er	idate, for modules with time to complete: 1 to often assessment will nder observance of Se	n less than 4 ECTS cr 4 weeks) or d) prese pe offered depends o	edits approx. 20 mir entation/seminar pre on the method of ass	nutes) or c) esentation sessment
Allocat			<u></u>			
Additio	onal inf	ormation				
Worklo	ad					
Teaching cycle						
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	immes)		
Modul	e appea	ars in				
	Naster's with 1 major Nanostructure Technology     JMU Würzburg • generated 26-Aug-2024 • exam. reg. da- ta record Master (120 ECTS) Nanostrukturtechnik - 2010     page 117 / 268					



Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Mathematical Physics (2012) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Mathematical Physics (2012) Master's degree (1 major) Mathematical Physics (2012) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2010)

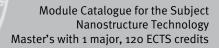
Module title			,	Abbreviation		
Spintro	nics				11-SPI-102-m01	
Module	coord	inator		Module offered by		
Managi	ng Dire	ector of the Institute of A	Applied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i i		
1 semester graduate		graduate	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					
magnet spin dy	oresist namics	overs the basic principle tance and tunnel magne s and current-induced s	etoresistance. As a las			
		ning outcomes				
mation	techno	know the basic principle blogy. They have gained esistance).				
Course	<b>S</b> (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
V + R (n	o infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, langu le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	ion on whether
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						nutes) or c) esentation sessment
Allocat	ion of p	olaces				
Additional information						
Workload						
Teaching cycle						
Referre	<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)					
Magharita	4la 4 10	Non-optimations Technological	INALLY MARY			
Master's wi (2010)	ui i majoi	r Nanostructure Technology		generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 119 / 268

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2010)

Module title					Abbreviation	
Method	ls in Sı	Irface Spectroscopy			11-MSS-102-m01	
Module	coord	inator		Module offered by		
Managi	ng Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semester graduate		sessment. The lectur at the beginning of t sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment in sessment at a later	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.			
Content	ts					
les of pl shape,	hotoel satellit	ectron spectroscopy (P	: Ultra-high vacuum, su ES), one-particle image particles, exemplary sy ods.	of PES, three step m	nodel, many-particle	effects, line
Intende	d learr	ning outcomes				
		know the physical prine late and interpret simp	ciples and experimenta le measurements.	l methods of surface	spectroscopy. They	are able to
Courses	<b>5</b> (type, n	umber of weekly contact hour	s, language — if other than Ger	rman)		
V (no in	format	ion on SWS (weekly co	ntact hours) and cours	e language available	2)	
		e <b>essment</b> (type, scope, lang le for bonus)	uage — if other than German, o	examination offered — if no	t every semester, informat	ion on whether
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						nutes) or c) esentation sessment
Allocati	ion of p	olaces				
Additional information						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Master's wit (2010)	th 1 major	Nanostructure Technology		generated 26-Aug-2024 • exa r (120 ECTS) Nanostrukturtecl	•	page 121 / 268

Bachelor' degree (1 major) Nanostructure Technology (2012) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2006)

Module	Abbreviation					
Electro	n Elect	ron Interaction			11-EEW-102-m01	
Module	e coord	inator		Module offered by	l	
Manag and As		ector of the Institute of <sup>-</sup> sics	Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	<u> </u>	od of grading	Only after succ. con	pl. of module(s)		
4	1	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester graduate C se ai si d th se te se			sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	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					
teraction through the three th	on). 4. I f functi	ntroduction to boson p	hase fields and interac malisation groups.8. C	tions. 5. Calculation	nsional electron gas (without in- of correlation functions. 6. Me- . 9. One-dimensional lattice mo-	
Intend	ed lear	ning outcomes				
The stu on.	Idents	know the principles of t	he theoretical descript	ion of electron-elect	ron interactions in one dimensi-	
Course	<b>S</b> (type, r	number of weekly contact hours	s, language — if other than Ge	rman)		
V + R (r	no infoi	mation on SWS (weekly	/ contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, information on whether	
groups project (approz Assess and wil examir	(appro report x. 30 m ment o Il be an nation r	x. 30 minutes per cand (approx. 8 to 10 pages, inutes) ffered: When and how o	idate, for modules with time to complete: 1 to often assessment will I nder observance of Sec	n less than 4 ECTS cr 4 weeks) or d) prese pe offered depends o	idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment 3 ASPO (general academic and	
Allocat			<u> </u>			
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
Macharla	ith 1 maio	r Nanostructure Technology	IMU Würzburg •	generated 26-Aug-2024 • ex	am. reg. da- page 123 / 268	



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) Mathematical Physics (2012) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2006)

Module title			Abbreviation			
Theoretical Solid State Physics 2     11-TFK2-111-m01						
Module coordinator		Module offered by				
Managing Director of the Institute of The and Astrophysics	oretical Physics	Faculty of Physics a	ind Astronomy			
ECTS Method of grading C	Only after succ. con	npl. of module(s)				
8 numerical grade	-					
Duration Module level C	Other prerequisites					
s a s c t t s t	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						
<ul> <li>a) metal-insulators and topological insul</li> <li>b) transport phenomena</li> <li>c) magnetic impurities in metals. Kondo</li> <li>d) electron-phonon interaction</li> <li>e) one-dimensional conductors</li> </ul> Intended learning outcomes The students have advanced knowledge mathematical or theoretical methods and stand the connections to experimental resolid-state theory and have discussed th	effect and heavy fe of the theoretical d d are able to apply esults. The individu	escription of solid-s them to problems of al students have ela	solid-state theory and under-			
<b>Courses</b> (type, number of weekly contact hours, lan	•	•				
V + R (no information on SWS (weekly co			able)			
Method of assessment (type, scope, language module is creditable for bonus)	— if other than German, o	examination offered — if no	ot every semester, information on whether			
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English						
Allocation of places						
Additional information						
Workload						

#### **Teaching cycle**

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

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## Module appears in

Master's degree (1 major) 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) Mathematical Physics (2012) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2006)

Modul	e title				Abbreviation	
Principles of two- and threedimensional Röntgen imag				5	11-ZDR-111-m01	
Modul	e coord	inator		Module offered by	<u> </u>	
Manag	ing Dire	ector of the Institute of A	pplied Physics	Faculty of Physics a	and Astronomy	
ECTS	<u> </u>	od of grading	Only after succ. co			
6		rical grade		• • • •		
Duratio		Module level	Other prerequisite	25		
1 semester		graduate	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	its					
ton abs project traction characc Intende The stu technic Course V + R (r Methor module is a) writt groups project (appro.	sorption ion, Fo n, visua terisati ed learn idents l ques us s (type, r no infor d of ass s creditab cen exan (appro report x. 30 m		f X-ray detection. Ma rative methods). Ima ns of X-ray imaging ir ). Radiation protect enerating X-rays and of image processing language – if other than G contact hours) and of lage – if other than German nutes) or b) oral exa date, for modules wit time to complete: 1 t	thematics of reconstr ge processing (image n the industrial sector tion and biological ra of their interactions of g as well as application (forman) course language avail n, examination offered — if n mination of one cand tith less than 4 ECTS ci to 4 weeks) or d) pres	uction algorithms ( data pre-processin (component testin diation effect (dose with matter. They k on areas of these m able) ot every semester, inform idate each or oral e redits approx. 20 n entation/seminar p	(filtered rear ng, feature ex- ng, material e,). now imaging ethods. nation on whether examination in ninutes) or c) presentation
and wi	ll be an	ffered: When and how c nounced in due form ur egulations) 2009.				
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
			_			
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulatio	ns for teaching-degree prog	grammes)		
	·	- Manual				1
	uth 1 major	r Nanostructure Technology	IMU Würzburg	• generated 26-Aug-2024 • e>	am reg da.	page 127 / 268

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2012) Master's degree (1 major) FOKUS Physics (2012) Master's degree (1 major) FOKUS Physics (2006)

Module title					Abbreviation
Introduction to Electron Microscopy					11-IEM-111-m01
Module coordinator				Module offered by	
Managi	ng Dire	ector of the Institute of Ap	plied Physics	Faculty of Physics a	ind Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
4	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate	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	rer will inform stude he course. Registrat n of will to seek adm I the qualification fo mester, the lecturer Students who mee n the current or in th date, students will h	alify for admission to as- nts about the respective details ion for the course will be con- nission to assessment. If stu- r admission to assessment over will put their registration for as- et all prerequisites will be admit- e subsequent semester. For as- ave to obtain the qualification for
Conten	ts				
(selecte on tech formati image f 7. Chen	ed-area nique) on, ima ormationical ar	ED, convergent beam ED 4. Transmission electro aging of microstructure). on, image simulation). 6.	), basics of electron o n microscopy (the ins 5. Can we see atoms . Scanning electron m microscope (energy-o	rystallography, com trument, contrast m Phigh-resolution ele ticroscopy (the instru lispersive X-ray micr	specimen. 3. Electron diffraction parison with the X-ray diffracti- echanisms, principles of image ctron microscopy (principle of ument, contrast mechanisms). oanalysis, electron energy loss techniques.
Intende	ed learr	ning outcomes			
They kr	now mie	croscoping procedures th	nat are used in praction	e in labs and the in	croscopy up to an atomic level. dustry as well as electron-micros- different research methods.
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V + R (n	io infor	mation on SWS (weekly o	contact hours) and co	urse language avail	able)
		s <b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English					
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				

## Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)
Module appears in
Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Nanostructure Technology (2010)
Bachelor' degree (1 major) Nanostructure Technology (2012)
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) FOKUS Physics (2010)
Master's degree (1 major) FOKUS Physics (2011)
Master's degree (1 major) Functional Materials (2012)
Master's degree (1 major) FOKUS Physics (2006)

Module title Abbreviation					Abbreviation	
Field Theory in Solid State Physics					11-FTFK-112-m01	
Module	e coord	inator		Module offered by		
Managi and Ast		ector of the Institute of Th sics	eoretical Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semester graduate		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					
outline 1 Coher 2 The fu 3 Pertui 4 Order 5 Green 6 The La	could rent sta unction rbation param o's func andau	be: Ites and review of seconc Ial integral formalism at f I theory at T=0 Inters and broken symme	l quantization inite temperatures T		d of functional integration. An	
		ning outcomes				
		have mastered the princi ed methods to current pr			icle systems. They are able to ap-	
Courses	<b>S</b> (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
V + R (n	io infor	mation on SWS (weekly o	contact hours) and co	ourse language availa	able)	
			ge — if other than German, e	examination offered — if no	t every semester, information on whether	
groups project (approx Assessi and wil	a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.					
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					

#### **Teaching cycle**

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

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## Module appears in

Master's degree (1 major) 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) Mathematical Physics (2012) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2006)

Module title Abbreviation						
Density Functional Theory and the Physics of Oxide Hetero				structure	11-DFT-142-m01	
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committ	ee	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		•			
of dens progran theory.	sity fun mmes s	ctional theory. They are such as Wien2k or VAS	ysical values of oxide h a able to model problen P. They can make simpl	ns of Theoretical Phy	sics with the help of	important
Intende	ed lear	ning outcomes				
of dens	sity fun mmes s	ctional theory. They are	ysical values of oxide h able to model problen P. They can make simpl	ns of Theoretical Phy	sics with the help of	important
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
V + D (r	no infoi	mation on SWS (week	y contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
report ( (approx Assess and wil gulatio	(approx x. 30 m ment o Il be an ns) 200	x. 8 to 10 pages, time to inutes) ffered: When and how nounced in due form u	or modules with less th o complete: approx. 1 to often assessment will l nder observance of Sec nglish	o 4 weeks) or d) pres	entation/seminar pr	esentation sessment
Allocat	ion of <sub>l</sub>	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	mmes)		
Module	e appea	urs in				
Master	's degr	ee (1 major) Physics (2	010)			
	-	ee (1 major) Physics (2				
	-	ee (1 major) Nanostruc				
	-	ee (1 major) Nanostruc ee (1 major) FOKUS Phy	ture Technology (2010)			
	-	ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy				
		r Nanostructure Technology		generated 26-Aug-2024 • example 2024	am. reg. da-	page 133 / 268
(2010)			•	r (120 ECTS) Nanostrukturtec	•	

Compu	e title				Abbreviation	
Computational Materials Science					11-CMS-122-m01	
Module coordinator				Module offered by	<u> </u>	
Managing Director of the Institute of Theoretical Physics and Astrophysics			Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	1	od of grading	Only after succ. con	npl. of module(s)		
8	nume	erical grade		-		
Duratio	on	Module level	Other prerequisites	;		
1 semester		graduate	sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	es must be met to quarer will inform stude the course. Registrat on of will to seek adm d the qualification for mester, the lecturer t. Students who mee n the current or in th date, students will h sment anew.	nts about the respe- tion for the course we hission to assessme or admission to asse will put their registre et all prerequisites we e subsequent seme	ective details vill be con- ent. If stu- essment over ration for as- vill be admit- ester. For as-
Conter	nts	1				
				a on temptate progr	annines of on comp	letely self-writ
4-5 top	oics of t ercise.	nes. Electronic submissi the lecture/exercise (fre <b>ming outcomes</b>	ion of all exercises and ely chosen by the stud	l approx. 20 minutes	presentation abou	t one of the
4-5 top the exe Intend Theore liarity of function materia as the	ercise. ercise. etical tro with DF ons by p als. Kno Kondo	he lecture/exercise (fre	ely chosen by the stud pics complemented by ch as VASP or Wien2k nto atomic orbitals usin many-body solutions o npurity solvers based o	l approx. 20 minutes ent) with a little mor / hands-on tutorials and and constructio ng wannier90. Focus if the AIM and explor on exact diagonaliza	to be held in the CII n of maximally loca on applications to re some of its limitir	t one of the e topic than in P-Pool. Fami- lized Wannier topological ng cases such
4-5 top the exe Intend Theore liarity of function materia as the Monte	ercise. ed lear etical tra- with DF ons by p als. Kn Kondo Carlo f	the lecture/exercise (fre ming outcomes eatment of the above to T software packages su projecting DFT results or owledge how to obtain regime. Ability to use in	ely chosen by the stud pics complemented by ch as VASP or Wienzk nto atomic orbitals usin many-body solutions o npurity solvers based of MFT self-consistency ed	l approx. 20 minutes ent) with a little mor / hands-on tutorials and and constructio ng wannier90. Focus if the AIM and explor on exact diagonaliza quations.	to be held in the CII n of maximally loca on applications to re some of its limitir	t one of the e topic than i P-Pool. Fami- lized Wannie topological ng cases such
4-5 top the exe Intend Theore liarity v functio materi as the Monte Course	ercise. ed lear etical transition with DF ons by p als. Kno Kondo Carlo f	the lecture/exercise (fre <b>ming outcomes</b> eatment of the above to T software packages su projecting DFT results or owledge how to obtain n regime. Ability to use in for the solution of the DI	ely chosen by the stud pics complemented by ch as VASP or Wien2k nto atomic orbitals usin many-body solutions o npurity solvers based of MFT self-consistency ed s, language – if other than Ge	l approx. 20 minutes ent) with a little mor / hands-on tutorials and and constructio ng wannier90. Focus of the AIM and explor on exact diagonaliza quations.	to be held in the CII n of maximally loca on applications to tion or continuous-	t one of the e topic than i P-Pool. Fami- lized Wannie topological ng cases such
4-5 top the exe Intend Theore liarity v functio materia as the Monte V + R (1 Metho	ercise. ed lear etical tra- with DF ons by p als. Kno Kondo Carlo f es (type, no info d of as	the lecture/exercise (fre <b>ming outcomes</b> eatment of the above to T software packages su projecting DFT results or owledge how to obtain in regime. Ability to use in for the solution of the DI number of weekly contact hours	ely chosen by the stud pics complemented by ch as VASP or Wienzk nto atomic orbitals usin many-body solutions o npurity solvers based o MFT self-consistency ed s, language — if other than Ge y contact hours) and co	l approx. 20 minutes ent) with a little mor / hands-on tutorials and and constructio ng wannier90. Focus of the AIM and explor on exact diagonaliza quations. rman)	to be held in the CII n of maximally loca on applications to re some of its limitir tion or continuous-	t one of the e topic than in P-Pool. Fami- lized Wannier topological ng cases such time quantum
4-5 top the exe Intend Theore liarity v functio materia as the Monte <b>Course</b> V + R (i <b>Metho</b> d) writt (appro d) press and wi examin	etical tre with DF ons by p als. Kno Kondo Carlo f es (type, no info d of as is credital ten exa x. 30 m sentation sment of carlo n	the lecture/exercise (fre <b>ming outcomes</b> eatment of the above to T software packages su projecting DFT results or owledge how to obtain in regime. Ability to use in for the solution of the DI number of weekly contact hourse rmation on SWS (weekly <b>sessment</b> (type, scope, lang	ely chosen by the stud pics complemented by ch as VASP or Wienzk nto atomic orbitals usin many-body solutions o npurity solvers based of WFT self-consistency ed s, language — if other than Ge y contact hours) and co uage — if other than German, or b) oral examination or c) project report (app n (approx. 30 minutes) often assessment will in nder observance of Sec	l approx. 20 minutes ent) with a little mor / hands-on tutorials and and constructio ng wannier90. Focus of the AIM and explor on exact diagonaliza quations. rman) ourse language avail examination offered — if no of one candidate eac prox. 8 to 10 pages, t be offered depends of	able) by every semester, information or the method of assistant	t one of the e topic than i P-Pool. Fami- lized Wannie topological ng cases such time quantun ation on whether ion in groups to 4 weeks) o ssessment
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4-5 top the exe Intend Theore liarity of function materia as the Monte <b>Course</b> V + R (In <b>Metho</b> module i a) writt (approd) press Assesss and wi examin Langua	ercise. ed lear etical trewith DF ons by p als. Kn Kondo Carlo f carlo f carlo f carlo f d of as is credital ten exa x. 30 m sentation sment c ill be ar nation n age of a	the lecture/exercise (free ming outcomes eatment of the above to T software packages su projecting DFT results or owledge how to obtain a regime. Ability to use in for the solution of the DF number of weekly contact hours rmation on SWS (weekly sessment (type, scope, lang ble for bonus) mination (90 minutes) of ninutes per candidate) of pon/seminar presentation offered: When and how of nounced in due form un regulations) 2009. assessment: German or	ely chosen by the stud pics complemented by ch as VASP or Wienzk nto atomic orbitals usin many-body solutions o npurity solvers based of WFT self-consistency ed s, language — if other than Ge y contact hours) and co uage — if other than German, or b) oral examination or c) project report (app n (approx. 30 minutes) often assessment will in nder observance of Sec	l approx. 20 minutes ent) with a little mor / hands-on tutorials and and constructio ng wannier90. Focus of the AIM and explor on exact diagonaliza quations. rman) ourse language avail examination offered — if no of one candidate eac prox. 8 to 10 pages, t be offered depends of	able) by every semester, information or the method of assistant	t one of the e topic than i P-Pool. Fami- lized Wannie topological ng cases such time quantun ation on whether ion in groups to 4 weeks) o ssessment
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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

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) FOKUS Physics (2010)

Module	e title				Abbreviation	
Computational Materials Science					11-CMS-131-m01	
Module coordinator				Module offered by	A	
Managing Director of the Institute of Theoretical Physics and Astrophysics			heoretical Physics	Faculty of Physics a	and Astronomy	
ECTS		od of grading	Only after succ. con	pl. of module(s)		
8	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester		graduate	sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective de at the beginning of the course. Registration for the course will be co sidered a declaration of will to seek admission to assessment. If stu dents have obtained the qualification for admission to assessment the course of the semester, the lecturer will put their registration for sessment into effect. Students who meet all prerequisites will be ad		n-  -  over   as-
Conten	its		•		· ·	
interac plemer ten pro 4-5 top the exe Intende	tion, dy nt the b ogramm ics of t ercise. ed lear	ynamic mean field theor asic ideas of different a les. Electronic submissi he lecture/exercise (free ning outcomes	y (DMFT exercise). Lec lgorithms, either base on of all exercises and ely chosen by the stud	ture + 4-5 exercises d on template progra approx. 20 minutes ent) with a little mor	crystal field symmetry, Could in the CIP pool. The exercise ammes or on completely self presentation about one of t e elaboration on the topic th ciences. They are able to dev	es im- f-writ he nan in
algorith	hms for	the application of these	e methods and to impl	lement them into pro		vetop
		number of weekly contact hours				
		mation on SWS (weekly				
		<b>Sessment</b> (type, scope, langu le for bonus)	uage — if other than German, o	examination offered — if no	ot every semester, information on whe	ether
in grou weeks) Assess and wil examin Langua	ps (app or d) p ment o ll be an nation r age of a	prox. 30 minutes per car presentation/seminar pr ffered: When and how o nounced in due form ur egulations) 2009. Issessment: German, En	ndidate) or c) project ro esentation (approx. 30 often assessment will b nder observance of Sec	eport (approx. 8 to 10 5 minutes) 5e offered depends o	date each or oral examination o pages, time to complete: 1 on the method of assessmer 3 ASPO (general academic a	to 4 nt
Allocat	tion of <sub>l</sub>	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

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) FOKUS Physics (2010)

Module title				Abbreviation		
Solid S	Solid State Spectroscopy 2				11-FKS2-132-m01	
Module coordinator				Module offered by		
Managi	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)		
6	nume	rical grade		-		
Duratio		Module level	Other prerequisites	<b>j</b>		
1 seme	ster	graduate				
Conten		3				
and exe gation gnetic a	citation of mag and ele ations	s such as phonons and netic, orbital and charg ctronic properties of th	scattering as a metho d magnetic waves; reso ge order; X-ray and neu in films and superlatti ; STEM ("scanning trar	onant elastic X-ray sc tron reflectometry; in ces; resonant inelast	attering and absorpt vestigation of the st ic X-ray scattering; in	tion; investi- ructural, ma- nvestigation
Intende	ed lear	ning outcomes				
tering,	moderi	n scattering theory, X-ra	scattering methods su ay and neutron reflecto iples and applications	metry and resonant i		
Course	<b>S</b> (type, r	umber of weekly contact hour	s, language — if other than Ge	rman)		
V + R (n	no infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		<b>essment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
in grou weeks) Assess and wil examin	ps (app or d) p ment o Il be an ation r	prox. 30 minutes per ca resentation/seminar p ffered: When and how	iinutes) or b) oral exam ndidate) or c) project r resentation (approx. 3 often assessment will nder observance of Se nglish	eport (approx. 8 to 10 o minutes) be offered depends o	o pages, time to com on the method of ass	nplete: 1 to 4 sessment
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)		
Module						
	-	ee (1 major) Physics (20				
	-	ee (1 major) Physics (20 ee (1 major) Nanostruc				
	-		ture Technology (2011)			
	-	ee (1 major) FOKUS Phy				
	-	ee (1 major) FOKUS Phy				
Master's wi	-	Nanostructure Technology	JMU Würzburg •	generated 26-Aug-2024 • ex	-	page 138 / 268
(2010)			ta record Maste	er (120 ECTS) Nanostrukturtec	hnik - 2010	

Module title					Abbreviation
Topology in Solid State Physics					11-TFP-132-m01
Module	coord	inator		Module offered by	
Managi	ng Dire	ector of the Institute of Ap	plied Physics	Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
6	nume	rical grade			
Duratio		Module level	Other prerequisites		
1 semes	ster	graduate			
Conten					
The stu	dents a	are familiar with the theo ecessary for their descrip			ysics. They know the mathemati- s to simple problems.
Intende	ed leari	ning outcomes			
The stu	dents a	-	, , ,		ysics. They know the mathemati- s to simple problems.
		umber of weekly contact hours, l		•••	
		mation on SWS (weekly o			able)
Method	l of ass		-		t every semester, information on whether
weeks) Assessi and wil examin	or d) p ment o l be an ation r	resentation/seminar pre ffered: When and how off	sentation (approx. 30 ten assessment will b ler observance of Sec	o minutes) be offered depends o	o pages, time to complete: 1 to 4 on the method of assessment 3 ASPO (general academic and
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	9			
	<u> </u>				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
		× •		,	
Module	appea	rs in			
		ee (1 major) Physics (2010	ວ)		
		ee (1 major) Physics (201			
Master'	s degr	ee (1 major) Nanostructur	e Technology (2011)		
		ee (1 major) Nanostructur			
Master'	s degr	ee (1 major) FOKUS Physi	cs (2010)		
Master'	s degr	ee (1 major) FOKUS Physi	cs (2011)		

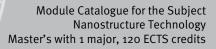


# **Complex Systems, Quantum Control and Biophysics**

(24 ECTS credits)

Module title					Abbreviation		
Nano-Optics					11-NOP-092-m01		
Module	e coord	inator		Module offered by			
Manag	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	ind Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
4	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 semester		graduate	sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the set sessment into effect ted to assessment i sessment at a later	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						
quantu Intende The stu retical <b>Course</b> R + V (r <b>Methoo</b> module is	m emit ed learn dents b princip S (type, r no infor d of ass	ters. Light emission in <b>ning outcomes</b> have specific and adva les and application are number of weekly contact hour mation on SWS (weekly <b>sessment</b> (type, scope, lang le for bonus)	ight. Microscopy. Option nano-tailored environn nced knowledge in the eas of nano-optics and s s, language — if other than Ge y contact hours) and co guage — if other than German,	nents. Plasmons. Op field of nano-optics. with current develop rman) purse language avail examination offered — if no	tical antennas. They are familiar wi ments in this field. able) t every semester, information	th the theo-	
groups project (approx Assess and wil examin Langua	(appro report x. 30 m ment o ll be an ation r ge of a	x. 30 minutes per cane (approx. 8 to 10 pages inutes) ffered: When and how nounced in due form u egulations) 2009. ssessment: German, E	ninutes) or b) oral exam lidate, for modules with , time to complete: 1 to often assessment will nder observance of Sen nglish	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends o	edits approx. 20 mir entation/seminar pre on the method of ass	nutes) or c) esentation sessment	
Allocat	ion of <sub>l</sub>	olaces					
 Additio	onal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	d to in	LPO I (examination regulat	ons for teaching-degree progra	ammes)			
Module	e appea	nrs in					
Bachel	or' deg	ree (1 major) Physics (2	2010)				
Master's wi (2010)	ith 1 majo	r Nanostructure Technology	-	generated 26-Aug-2024 • ex er (120 ECTS) Nanostrukturtec	-	page 141 / 268	

#### Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Bachelor' degree (1 major) Physics (2012) 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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010)

Module	e title				Abbreviation	
Biophysical Measurement Technology in Medical Scien					11-BMT-092-m01	
Module coordinator				Module offered by	<u> </u>	
		ector of the Institute of A	Applied Physics	Faculty of Physics a	ind Astronomy	
ECTS	1	od of grading	Only after succ. con		ind Astronomy	
6		rical grade				
Duratio	•	Module level	Other prerequisites			
1 semester		graduate	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	Its					
topics sound image	are con and MF process		ue, computer tomogra	phy, imaging technic	ques of nuclear med	icine, ultra-
Intend	ed lear	ning outcomes				
derstar images	nd the p 5.	know the physical princ principles of image gene	eration and are able to	explain different teo		
		umber of weekly contact hours			abla)	
Metho	d of ass	mation on SWS (weekly sessment (type, scope, langu le for bonus)			•	ion on whether
groups project (approz Assess and wil examir	(appro report x. 30 m ment o Il be an nation r	mination (approx. 90 mi x. 30 minutes per candi (approx. 8 to 10 pages, inutes) ffered: When and how c nounced in due form ur egulations) 2009. ssessment: German, En	date, for modules with time to complete: 1 to often assessment will h oder observance of Sec	n less than 4 ECTS cr 4 weeks) or d) prese pe offered depends o	edits approx. 20 min entation/seminar pro on the method of as:	nutes) or c) esentation sessment
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulatio	ns for teaching-degree progra	mmes)		
				,		
	ith 4 maio	Nanostructure Technology	IMI I Willinghung a	generated 26-Aug-2024 • ex	am rag da	page 143 / 268



Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) 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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2012)

	e title				Abbreviation	
Labora	tory an	d Measurement Technol	ogy in Biophysics		11-LMB-092-m01	
Module coordinator				Module offered by	odule offered by	
Managing Director of the Institute of Applied Physics			pplied Physics	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i		
1 seme	ester	graduate	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	nts	<u> </u>	admission to asses			
physica measu methoo Intend	al proce ring teo ds of st <b>ed lear</b>	edures for the examination hniques and sensors, m ructure elucidation of bio <b>ning outcomes</b>	on and manipulation ethods of single-part omolecules.	of biological system	as the physical principles of bio- s. The main topics are optical al microscoping techniques and	
					e physical principles of biophy- hey have knowledge of optical	
sical p measu biomol	rocedu ring teo lecules.	res for the examination a hniques and their applic	nd manipulation of b cations and are able t	iological systems. The oapply techniques of technique	hey have knowledge of optical	
sical p measu biomol <b>Course</b>	rocedui ring tec lecules <b>es</b> (type, r	res for the examination a hniques and their applic number of weekly contact hours,	nd manipulation of b cations and are able t language — if other than Gen	iological systems. The oapply techniques of the man)	hey have knowledge of optical of structure elucidation to simple	
sical pr measu biomol <b>Course</b> R + V (r	rocedui ring tec lecules es (type, r no infor	res for the examination a hniques and their applic number of weekly contact hours, mation on SWS (weekly	nd manipulation of b cations and are able t language — if other than Gen contact hours) and co	iological systems. The oapply techniques of man)	hey have knowledge of optical of structure elucidation to simple able)	
sical pr measu biomol Course R + V (r Metho	rocedur ring teo lecules. es (type, r no infor d of ass	res for the examination a hniques and their applic number of weekly contact hours, mation on SWS (weekly	nd manipulation of b cations and are able t language — if other than Gen contact hours) and co	iological systems. The oapply techniques of man)	hey have knowledge of optical of structure elucidation to simple	
sical pr measu biomol Course R + V (r Methor module i: a) writt groups project (appro. Assess and wi examir	ring tec ring tec lecules. es (type, r no infor d of ass s creditab ten exan s (approt t report x. 30 m sment o ll be an nation r	res for the examination a hniques and their applic number of weekly contact hours, mation on SWS (weekly <b>sessment</b> (type, scope, langua le for bonus) mination (approx. 90 min ix. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of	Ind manipulation of b cations and are able t language — if other than Gen contact hours) and co age — if other than German, nutes) or b) oral exam date, for modules with time to complete: 1 to ften assessment will I der observance of Sec	iological systems. The o apply techniques of man) ourse language avail examination offered — if no hination of one candi h less than 4 ECTS or 4 weeks) or d) prese be offered depends of	hey have knowledge of optical of structure elucidation to simple able)	
sical pr measu biomol <b>Course</b> R + V (r <b>Metho</b> a) writt groups project (appro. Assess and wi examir Langua	ring tec ring tec lecules. es (type, r no infor d of ass s creditab ten exan s (approt t report x. 30 m sment o ll be an nation r	res for the examination a hniques and their applic number of weekly contact hours, mation on SWS (weekly <b>sessment</b> (type, scope, langua le for bonus) mination (approx. 90 min ix. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of nounced in due form une egulations) 2009. ssessment: German, Eng	Ind manipulation of b cations and are able t language — if other than Gen contact hours) and co age — if other than German, nutes) or b) oral exam date, for modules with time to complete: 1 to ften assessment will I der observance of Sec	iological systems. The o apply techniques of man) ourse language avail examination offered — if no hination of one candi h less than 4 ECTS or 4 weeks) or d) prese be offered depends of	hey have knowledge of optical of structure elucidation to simple able) of every semester, information on whether idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment	
sical pr measu biomol <b>Course</b> R + V (r <b>Metho</b> a) writt groups project (appro. Assess and wi examir Langua	rocedui ring tec lecules. (type, r no infor <b>d of ass</b> s creditab ten exait (approt t report x. 30 m sment o Il be an nation r age of a	res for the examination a hniques and their applic number of weekly contact hours, mation on SWS (weekly <b>sessment</b> (type, scope, langua le for bonus) mination (approx. 90 min ix. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of nounced in due form une egulations) 2009. ssessment: German, Eng	Ind manipulation of b cations and are able t language — if other than Gen contact hours) and co age — if other than German, nutes) or b) oral exam date, for modules with time to complete: 1 to ften assessment will I der observance of Sec	iological systems. The o apply techniques of man) ourse language avail examination offered — if no hination of one candi h less than 4 ECTS or 4 weeks) or d) prese be offered depends of	hey have knowledge of optical of structure elucidation to simple able) of every semester, information on whether idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment	
sical pr measu biomol <b>Course</b> R + V (r <b>Metho</b> a) writt groups project (appro. Assess and wi examir Langua <b>Allocat</b>	ring tec lecules. es (type, r no infor d of ass s creditab ten exal s (approt t report x. 30 m sment o Il be an nation r age of a tion of J	res for the examination a hniques and their applic number of weekly contact hours, mation on SWS (weekly <b>sessment</b> (type, scope, langua le for bonus) mination (approx. 90 min ix. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of nounced in due form une egulations) 2009. ssessment: German, Eng	Ind manipulation of b cations and are able t language — if other than Gen contact hours) and co age — if other than German, nutes) or b) oral exam date, for modules with time to complete: 1 to ften assessment will I der observance of Sec	iological systems. The o apply techniques of man) ourse language avail examination offered — if no hination of one candi h less than 4 ECTS or 4 weeks) or d) prese be offered depends of	hey have knowledge of optical of structure elucidation to simple able) of every semester, information on whether idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment	
sical pr measu biomol <b>Course</b> R + V (r <b>Metho</b> a) writt groups project (appro. Assess and wi examir Langua <b>Allocat</b>	ring tec lecules. es (type, r no infor d of ass s creditab ten exal s (approt t report x. 30 m sment o Il be an nation r age of a tion of J	res for the examination a chniques and their applic number of weekly contact hours, mation on SWS (weekly sessment (type, scope, langua le for bonus) mination (approx. 90 min x. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of nounced in due form une egulations) 2009. ssessment: German, Eng blaces	Ind manipulation of b cations and are able t language — if other than Gen contact hours) and co age — if other than German, nutes) or b) oral exam date, for modules with time to complete: 1 to ften assessment will I der observance of Sec	iological systems. The o apply techniques of man) ourse language avail examination offered — if no hination of one candi h less than 4 ECTS or 4 weeks) or d) prese be offered depends of	hey have knowledge of optical of structure elucidation to simple able) of every semester, information on whether idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment	
sical pr measu biomol <b>Course</b> R + V (r <b>Metho</b> a) writt groups project (appro. Assess and wi examir Langua <b>Allocat</b>	ring tec lecules. es (type, r no infor d of ass s creditab ten exal s (approt t report x. 30 m sment o Il be an hation r age of a tion of J	res for the examination a chniques and their applic number of weekly contact hours, mation on SWS (weekly sessment (type, scope, langua le for bonus) mination (approx. 90 min x. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of nounced in due form une egulations) 2009. ssessment: German, Eng blaces	Ind manipulation of b cations and are able t language — if other than Gen contact hours) and co age — if other than German, nutes) or b) oral exam date, for modules with time to complete: 1 to ften assessment will I der observance of Sec	iological systems. The o apply techniques of man) ourse language avail examination offered — if no hination of one candi h less than 4 ECTS or 4 weeks) or d) prese be offered depends of	hey have knowledge of optical of structure elucidation to simple able) of every semester, information on whether idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment	
sical pr measu biomol Course R + V (r Methor module is a) writt groups project (appro. Assess and wi examir Langua Allocat	ring tec lecules. es (type, r no infor d of ass s creditab ten exal s (approt t report x. 30 m sment o Il be an hation r age of a tion of J	res for the examination a chniques and their applic number of weekly contact hours, mation on SWS (weekly sessment (type, scope, langua le for bonus) mination (approx. 90 min x. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of nounced in due form une egulations) 2009. ssessment: German, Eng blaces	Ind manipulation of b cations and are able t language — if other than Gen contact hours) and co age — if other than German, nutes) or b) oral exam date, for modules with time to complete: 1 to ften assessment will I der observance of Sec	iological systems. The o apply techniques of man) ourse language avail examination offered — if no hination of one candi h less than 4 ECTS or 4 weeks) or d) prese be offered depends of	hey have knowledge of optical of structure elucidation to simple able) of every semester, information on whether idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment	
sical pr measu biomol Course R + V (r Methor module i: a) writt groups project (appro. Assess and wi examir Langua Allocat  Worklo	ring tec lecules. es (type, r no infor d of ass s creditab ten exal s (approt t report x. 30 m sment o Il be an hation r age of a tion of J	res for the examination a hniques and their applic mumber of weekly contact hours, mation on SWS (weekly sessment (type, scope, langua le for bonus) mination (approx. 90 min ox. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of nounced in due form un egulations) 2009. ssessment: German, Eng blaces	Ind manipulation of b cations and are able t language — if other than Gen contact hours) and co age — if other than German, nutes) or b) oral exam date, for modules with time to complete: 1 to ften assessment will I der observance of Sec	iological systems. The o apply techniques of man) ourse language avail examination offered — if no hination of one candi h less than 4 ECTS or 4 weeks) or d) prese be offered depends of	hey have knowledge of optical of structure elucidation to simple able) of every semester, information on whether idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment	

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

### Module appears in

Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Nanostructure Technology (2010)
Bachelor' degree (1 major) Nanostructure Technology (2012)
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) FOKUS Physics - Nanostructuring Technology (2010)
Master's degree (1 major) FOKUS Physics (2010)
Master's degree (1 major) FOKUS Physics (2011)
Master's degree (1 major) Functional Materials (2012)

Module title		Abbreviation			
Physics of Complex Systems		11-PKS-092-m01			
Module coordinator		Module offered by			
Managing Director of the Institute of The and Astrophysics	eoretical Physics	Faculty of Physics and Astronomy			
ECTS Method of grading	Only after succ. com	pl. of module(s)			
6 numerical grade -					
Duration Module level 0	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					
<ol> <li>Theory of critical phenomena in therm</li> <li>Introduction into the physics out of ec</li> <li>Entropy production and fluctuationst</li> <li>Phase transitions away from equilibriu</li> <li>Universalityt</li> <li>Spin glassest</li> <li>Theory of neural networks</li> </ol>	quilibriumt				
Intended learning outcomes					
The students have specific and advance methods of Statistical Physics, Computa such systems. They are able to work on o	ational Physics and r	non-linear dynamics			
<b>Courses</b> (type, number of weekly contact hours, lar	nguage — if other than Ger	nan)			
R + V (no information on SWS (weekly co	ontact hours) and co	urse language availa	able)		
Method of assessment (type, scope, language module is creditable for bonus)	e — if other than German, e	xamination offered — if no	t every semester, information on whether		
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. Language of assessment: German, English					
Allocation of places					
Additional information					
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) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2012) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012) 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) Mathematical Physics (2012) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

Module ti	tle			Abbreviation	
Quantum	Information and Quantum (	Computing		11-QIC-092-m01	
Module c	oordinator		Module offered by		
Managing and Astro	Director of the Institute of physics	Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS N	lethod of grading	Only after succ. con	npl. of module(s)		
5 n	umerical grade				
Duration	Module level	Other prerequisites			
1 semeste	er graduate	sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	Certain 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		
Contents			sment anew.		
tron spin states. <b>Intended</b> The stude They are a	states. The third part covers	the description and e erstanding of quantum ns of quantum informa	xplanation of decoh theory and basic kn tion theory.	ipulation of coherent two-elec- erence of quantum mechanical owledge of quantum calculation.	
	information on SWS (weekly			able)	
Method o	· · · · · ·			ot every semester, information on whether	
groups (a project re (approx. <u>;</u> Assessmo and will b examinat	pprox. 30 minutes per cand port (approx. 8 to 10 pages, 30 minutes) ent offered: When and how o	idate, for modules with time to complete: 1 to often assessment will I nder observance of Sec	n less than 4 ECTS ci 4 weeks) or d) prese be offered depends	idate each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment 3 ASPO (general academic and	
	n of places	<u>u</u> -			
Additiona	l information				
Workload					
Teaching	cycle				

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

### Module appears in

Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Mathematical Physics (2009)
Bachelor' degree (1 major) Mathematical Physics (2012)
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) Mathematical Physics (2012)
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)
Master's degree (1 major) FOKUS Physics (2010)
Master's degree (1 major) FOKUS Physics (2011)

Module	e title				Abbreviation	
Statist	ics, Dat	ta Analysis and Compu	iter Physics		11-SDC-092-m01	
Module	e coord	inator		Module offered by		
		ector of the Institute of	Applied Physics	Faculty of Physics and Astronomy		
ECTS	ECTS Method of grading Only after succ.			pl. of module(s)		
4	numerical grade					
Duratio			Other prerequisites			
1 semester graduate		sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	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	Its					
		a analysis and compu	ter physics.			
Intende	ed lear	ning outcomes				
The stu Physics		have specific and adva	nced knowledge in the	field of statistics, da	ata analysis and Cor	mputational
Course	<b>S</b> (type, r	number of weekly contact hou	rs, language — if other than Ger	rman)		
R + V (r	no infor	mation on SWS (week	ly contact hours) and co	ourse language avail	able)	
module is	s creditab	le for bonus)	guage — if other than German,			
groups project (approx Assess and wil examin Langua	(appro report x. 30 m ment o Il be an nation r age of a	x. 30 minutes per can (approx. 8 to 10 pages inutes) ffered: When and how nounced in due form t egulations) 2009. ssessment: German, E	ninutes) or b) oral exam didate, for modules with s, time to complete: 1 to often assessment will h under observance of Sec inglish	n less than 4 ECTS cr 4 weeks) or d) prese pe offered depends o	edits approx. 20 mi entation/seminar pr on the method of as	nutes) or c) resentation rsessment
Allocat	ion of p	olaces				
 Additio	onal inf	ormation				
 Wassi-1						
Worklo	Dad					
 Teeshi						
Teachi	ng cycl	e				
Referre	a to in	LFUI (examination regulat	ions for teaching-degree progra	mmes)		
 Module			2010)			
 <b>Module</b> Bachel	or' deg	<b>irs in</b> ree (1 major) Physics ( ree (1 major) Physics (				

Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012) Master's degree (1 major) Mathematics (2012) 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) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

Julius-Maxir

UNIVERSITÄT

WÜRZBURG



## **Other Modules Specialisation**

(24 ECTS credits)

Module title Abbreviation							
Modul	е Туре	4E Special Training Expe	rimental Physics		11-SF-4E-072-m01		
Module coordinator Module offered by							
Manag	ing Dire	ector of the Institute of Ap	oplied Physics	Faculty of Physics a	nd Astronomy		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
4	nume	rical grade					
Duratio		Module level	Other prerequisites	i			
1 seme	ester	graduate					
Conter	nts	10	<u>I</u>				
Specifi Physic		nced knowledge of one c	or more of the Faculty	's current research a	reas in the field of Experimental		
Intend	ed lear	ning outcomes					
		have specific and advanc mental Physics.	ed knowledge of one	e or more current res	earch areas of the faculty in the		
Course	<b>es</b> (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)			
V + R (I	no infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
Metho	d of ass	sessment (type, scope, langua	ge — if other than German,	examination offered — if no	t every semester, information on whether		
		le for bonus)	· · · · · · · · · · · · · · · · · · ·				
		mination (approx. 90 mir oral examination in group			oral examination of one candi- t (approx. 8 pages)		
Allocat	tion of <sub>l</sub>	places					
	1						
Additio	onal inf	ormation					
Worklo	bad						
Teachi	ng cycl	e					
	- /						
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	ammes)			
			0.0000000000000000000000000000000000000	· · · · /			
	e appez	ars in					
Modul			-)				
Modul Master	Master's degree (1 major) Physics (2010) Master's degree (1 major) Nanostructure Technology (2010)						
Master	-						
Master Master	's degr		re Technology (2010)				
Master Master Master	r's degr r's degr	ee (1 major) Nanostructu	re Technology (2010) cs - Nanostructuring				
Master Master Master Master	r's degr r's degr r's degr	ee (1 major) Nanostructu ee (1 major) FOKUS Physi	re Technology (2010) cs - Nanostructuring cs (2010)	Technology (2010)			

Module	e title				Abbreviation	
Module	е Туре и	4I Special Training Interd	lisciplinary Research	Fields	11-SF-4l-072-m01	
Module coordinator				Module offered by	I	
		ectors of the Institute of A f Theoretical Physics and		Faculty of Physics a	and Astronomy	
			Only after succ. con	npl. of module(s)		
4	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Contents						
Specifi	c, adva	nced knowledge of one o	or more of the Faculty	's current research a	areas.	
		ning outcomes	,			
The stu terdisci		•	ed knowledge of one	or more current res	earch areas of the faculty in an in	
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V + R (n	infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		<b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		nination (approx. 90 mir ral examination in group			) oral examination of one candi- rt (approx. 8 pages)	
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	irs in				
Master	's degr	ee (1 major) Physics (201	o)			
	-	ee (1 major) Nanostructu				
	-	ee (1 major) FOKUS Physi	-	Technology (2010)		
	-	ee (1 major) FOKUS Physi		Technology (cool)		
	-	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi	-	rechnology (2006)		
master	3 ucgli		(2000)			

Module	e title			Abbreviation		
Module Type 4T Special Training Theoretical Physics       11-SF-4T-072-m01						
Module coordinator Module					1	
Manag and As	-	ector of the Institute of <sup>-</sup> sics	Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)		
4	numerical grade					
Duratio	on	Module level	Other prerequisites	5		
1 seme	ster	graduate				
Conten	ts					
Specifi Physics		nced knowledge of one	or more of the Faculty	/'s current research a	reas in the field of Theoretical	
Intend	ed lear	ning outcomes				
		have specific and advar etical Physics.	nced knowledge of one	e or more current res	earch areas of the faculty in the	
Course	<b>S</b> (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
V + R (r	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
module is a) writt	en exa	le for bonus)	inutes) or b) talk (app	rox. 30 minutes) or c	ot every semester, information on whether ) oral examination of one candi-	
Allocat						
Additio	nal inf	ormation				
	inat init					
Worklo	ad					
			_			
Teachi		P				
	is cycl					
Referre	ed to in	<b>LPO I</b> (examination regulation	ons for teaching-degree progra	ammes)		
				·······		
Module	e appea	ars in				
Master Master Master Master Master	's degr 's degr 's degr 's degr 's degr	ee (1 major) Physics (20 ee (1 major) Nanostruct ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy	ure Technology (2010) sics - Nanostructuring sics (2010) sics - Nanostructuring	Technology (2010)		

Modul	e title				Abbreviation
Module	е Туре	5E Special Training Expe	rimental Physics		11-SF-5E-072-m01
Module coordinator Module offered by					
Managing Director of the Institute of Applied Physics				Faculty of Physics a	and Astronomy
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio		Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	its		1		
Specifi Physics		nced knowledge of one o	or more of the Faculty	's current research a	areas in the field of Experimental
Intend	ed lear	ning outcomes			
		have specific and advand mental Physics.	ced knowledge of one	e or more current res	earch areas of the faculty in the
Course	<b>S</b> (type, 1	number of weekly contact hours,	language — if other than Gei	rman)	
V + R (r	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avail	able)
module is	s creditat	le for bonus)			ot every semester, information on whether
		mination (approx. 90 mir oral examination in group			) oral examination of one candi- rt (approx. 10 pages)
Allocat	ion of	places			
Additic	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	immes)	
Module	e appea	ars in			
		ee (1 major) Physics (201			
	-	ee (1 major) Nanostructu			
Master	-	ee (1 major) FOKUS Physi	ics - Nanostructuring	Technology (2010)	
Master	-	ee (1 major) FOKUS Physi			
Master Master	's degr		ics - Nanostructuring	Technology (2006)	

	e title				Abbreviation	
Module	еТуре	5I Special Training Interc	lisciplinary Research	Fields	11-SF-5I-072-m01	
Module coordinator				Module offered by		
-	-	ectors of the Institute of A f Theoretical Physics and		Faculty of Physics a	and Astronomy	
ECTS				npl. of module(s)		
5	numerical grade					
Duratio	on	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Contents						
Specifi	c, adva	nced knowledge of one of	or more of the Faculty	's current research a	areas.	
Intende	ed lear	ning outcomes				
The stu terdisc			ced knowledge of one	e or more current res	earch areas of the faculty in an in	
Course	<b>S</b> (type, r	number of weekly contact hours,	language — if other than Gei	rman)		
V + R (r	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	lable)	
Metho	d of ass	<b>Sessment</b> (type, scope, langua	age — if other than German,	examination offered — if n	ot every semester information on whether	
module is	s creditab	le for bonus)			or every semester, mornation on whether	
a) writt	en exa		nutes) or b) talk (appr	rox. 30 minutes) or c	) oral examination of one candi-	
a) writt	en exa ach or c	mination (approx. 90 mir oral examination in group	nutes) or b) talk (appr	rox. 30 minutes) or c	) oral examination of one candi-	
a) writt date ea	en exa ach or c	mination (approx. 90 mir oral examination in group	nutes) or b) talk (appr	rox. 30 minutes) or c	) oral examination of one candi-	
a) writt date ea <b>Allocat</b> 	en exa ach or c ion of J	mination (approx. 90 mir oral examination in group	nutes) or b) talk (appr	rox. 30 minutes) or c	) oral examination of one candi-	
a) writt date ea <b>Allocat</b> 	en exa ach or c ion of J	mination (approx. 90 mir oral examination in group <b>olaces</b>	nutes) or b) talk (appr	rox. 30 minutes) or c	) oral examination of one candi-	
a) writt date ea <b>Allocat</b> 	en exa ach or c ion of j onal inf	mination (approx. 90 mir oral examination in group <b>olaces</b>	nutes) or b) talk (appr	rox. 30 minutes) or c	) oral examination of one candi-	
a) writt date ea Allocat  Additio 	en exa ach or c ion of j onal inf	mination (approx. 90 mir oral examination in group <b>olaces</b>	nutes) or b) talk (appr	rox. 30 minutes) or c	) oral examination of one candi-	
a) writt date ea Allocat  Additio	en exa ach or c ion of j onal inf	mination (approx. 90 mir oral examination in group places ormation	nutes) or b) talk (appr	rox. 30 minutes) or c	) oral examination of one candi-	
a) writt date ea Allocat  Additio  Worklo	en exa ach or c ion of j onal inf	mination (approx. 90 mir oral examination in group places ormation	nutes) or b) talk (appr	rox. 30 minutes) or c	) oral examination of one candi-	
a) writt date ea Allocat  Additio  Worklo  Teachin	en exa ach or c ion of j onal inf pad	mination (approx. 90 mir oral examination in group places ormation	nutes) or b) talk (appr os (approx. 30 minute	rox. 30 minutes) or c s) or d) project repo	) oral examination of one candi-	
a) writt date ea Allocat  Additio  Worklo  Teachin	en exa ach or c ion of j onal inf pad	mination (approx. 90 mir oral examination in group blaces ormation	nutes) or b) talk (appr os (approx. 30 minute	rox. 30 minutes) or c s) or d) project repo	) oral examination of one candi-	
a) writt date ea Allocat  Additio  Worklo  Teachin	en exa ach or c ion of p onal inf pad ng cycl ed to in	mination (approx. 90 mir oral examination in group blaces ormation e E	nutes) or b) talk (appr os (approx. 30 minute	rox. 30 minutes) or c s) or d) project repo	) oral examination of one candi-	
a) writt date ea Allocat  Moditio  Teachin  Referre  Module	en exa ach or c ion of p onal inf oad ng cycl ed to in e appea	mination (approx. 90 mir oral examination in group places ormation e LPOI (examination regulation ars in ee (1 major) Physics (201	nutes) or b) talk (appr os (approx. 30 minute s for teaching-degree progra	rox. 30 minutes) or c s) or d) project repo	) oral examination of one candi-	
a) writt date ea Allocat  Worklo  Teachin  Referre Module Master Master	en exa ach or c ion of p onal inf pad ng cycl ed to in e appea 's degr 's degr	mination (approx. 90 mir oral examination in group places ormation e LPOI (examination regulation ars in ee (1 major) Physics (201 ee (1 major) Nanostructu	nutes) or b) talk (appr os (approx. 30 minute s for teaching-degree progra o) re Technology (2010)	rox. 30 minutes) or c s) or d) project repo	) oral examination of one candi-	
a) writt date ea Allocat  Worklo  Teachin  Referre  Module Master Master Master	en exa ach or c ion of p onal inf pad ng cycl ed to in e appea 's degr 's degr 's degr	e LPO I (examination regulation ars in ee (1 major) Physics (201 ee (1 major) FOKUS Physi	o) re Technology (2010) ics - Nanostructuring	rox. 30 minutes) or c s) or d) project repo	) oral examination of one candi-	
a) writt date ea Allocat  Additio  Worklo  Teachin  Referre  Module Master Master Master Master	en exa ach or c ion of p onal inf pad ed to in e appea 's degr 's degr 's degr	mination (approx. 90 mir oral examination in group places ormation e LPOI (examination regulation ars in ee (1 major) Physics (201 ee (1 major) Nanostructu	nutes) or b) talk (appros. 30 minute os (approx. 30 minute s for teaching-degree progra o) re Technology (2010) ics - Nanostructuring ics (2010)	rox. 30 minutes) or c rs) or d) project repo ammes) Technology (2010)	) oral examination of one candi-	

Module	e title			Abbreviation		
Module Type 5T Special Training Theoretical Physics       11-SF-5T-072-m01						
Module	e coord	inator		Module offered by		
Manag and As	-	ector of the Institute of Th sics	neoretical Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)		
5	numerical grade					
Duratio	on	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conten	ts		·			
Specifi Physics		nced knowledge of one of	or more of the Faculty	's current research a	reas in the field of Theoretical	
Intende	ed lear	ning outcomes				
		have specific and advand tical Physics.	ced knowledge of one	e or more current res	earch areas of the faculty in the	
Course	<b>S</b> (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
V + R (r	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
module is a) writt	en exa	le for bonus)	nutes) or b) talk (app	rox. 30 minutes) or c)	oral examination of one candi- t (approx, 10 pages)	
Allocat				, , , , , , , , , , , , , , , , , , ,		
Additio	nal inf	ormation	-			
Worklo	ad					
Teachi	ng cvcl	e				
Referre	d to in	LPOI (examination regulation	s for teaching-degree progra	ammes)		
Module	e appea	irs in				
Master Master Master Master Master	's degr 's degr 's degr 's degr 's degr	ee (1 major) Physics (201 ee (1 major) Nanostructu ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi	re Technology (2010) ics - Nanostructuring ics (2010) ics - Nanostructuring	Technology (2010)		

Module title					Abbreviation	
Module Type 6E Special Training Experimental Physics					11-SF-6E-072-m01	
Module	e coord	inator		Module offered by		
Manag	ing Dir	ector of the Institute of Ap	oplied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	on .	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Its		ļ			
Specifi Physics		nced knowledge of one o	or more of the Faculty	's current research a	reas in the field of Experimental	
Intend	ed lear	ning outcomes				
		have specific and advanc mental Physics.	ed knowledge of one	e or more current reso	earch areas of the faculty in the	
Course	<b>S</b> (type, 1	number of weekly contact hours, I	language — if other than Ger	rman)		
V + R (r	no infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
		mination (approx. 90 mir oral examination in group			oral examination of one candi- t (approx. 12 pages)	
Allocat	ion of	places				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	ummes)		
Module appears in						
Master's degree (1 major) Physics (2010)						
Master's degree (1 major) Nanostructure Technology (2010)						
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)						
Master's degree (1 major) FOKUS Physics (2010)						
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2006)						
	-	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi	cs - Nanostructuring	Technology (2006)		

Module title					Abbreviation	
Module Type 6I Special Training Interdisciplinary Research				Fields	11-SF-6l-072-m01	
Module	e coord	inator		Module offered by		
-	-	ectors of the Institute of <i>I</i> f Theoretical Physics and		Faculty of Physics	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Its					
Specifi	c, adva	nced knowledge of one of	or more of the Faculty	's current research	areas.	
		ning outcomes				
The stu terdisci			ced knowledge of one	e or more current res	search areas of the faculty in an in	
Course	<b>S</b> (type, r	number of weekly contact hours,	language — if other than Ger	rman)		
V + R (r	no infor	mation on SWS (weekly	contact hours) and co	ourse language avai	lable)	
		s <b>essment</b> (type, scope, langua Ile for bonus)	age — if other than German, o	examination offered — if n	ot every semester, information on whether	
		mination (approx. 90 mir oral examination in group			c) oral examination of one candi- ort (approx. 12 pages)	
Allocat	ion of <sub>l</sub>	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulation	is for teaching-degree progra	immes)		
Module	e appea	ars in				
Master	's degr	ee (1 major) Physics (201	.0)			
Master's degree (1 major) Nanostructure Technology (2010)						
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)						
	- , , , , , , , , , , , , , , , , , , ,					
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2006) Master's degree (1 major) FOKUS Physics (2006)						

Module title					Abbreviation
Module Type 6T Special Training Theoretical Physics11-SF-6T-072-m01					
Module	e coord	inator		Module offered by	
Manag and As	-	ector of the Institute of <sup>-</sup> sics	Theoretical Physics	Faculty of Physics a	ind Astronomy
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)	
6	nume	rical grade			
Duratio	on	Module level	Other prerequisites	5	
1 seme	ster	graduate			
Conten	ts				
Specifi Physics		nced knowledge of one	or more of the Faculty	's current research a	reas in the field of Theoretical
Intend	ed lear	ning outcomes			
		have specific and advar etical Physics.	nced knowledge of one	e or more current res	earch areas of the faculty in the
Course	<b>S</b> (type, r	number of weekly contact hours	, language — if other than Ge	rman)	
V + R (r	no infor	mation on SWS (weekly	v contact hours) and co	ourse language avail	able)
module is a) writt	en exa	le for bonus)	inutes) or b) talk (app	rox. 30 minutes) or c	ot every semester, information on whether ) oral examination of one candi-
Allocat					(approx. 12 pages)
Additio	nal inf	ormation			
Worklo	ad				
Teachi		<u>م</u>			
	is cycl				
Referre	d to in	LPOI (examination regulation	ons for teaching-degree progra	ammes)	
Module	e appea	urs in			
Master Master Master Master Master	's degr 's degr 's degr 's degr 's degr	ee (1 major) Physics (20 ee (1 major) Nanostruct ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy	ure Technology (2010) sics - Nanostructuring sics (2010) sics - Nanostructuring	Technology (2010)	

Module title Al					Abbreviation
Modul	e Type	BE Special Training Expe	rimental Physics		11-SF-8E-072-m01
Modul	e coord	inator		Module offered by	
Manag	ing Dire	ector of the Institute of Ap	oplied Physics	Faculty of Physics a	nd Astronomy
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
8	nume	rical grade		-	
Duratio		Module level	Other prerequisites		
1 seme	ester	graduate			
Conter		0	I		
	ic, adva	nced knowledge of one c	or more of the Faculty	's current research a	reas in the field of Experimental
Intend	ed lear	ning outcomes			
		have specific and advanc mental Physics.	ed knowledge of one	e or more current res	earch areas of the faculty in the
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)	
V + R (I	no infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
Metho	d of ass	sessment (type, scope, langua	ge — if other than German, o	examination offered — if no	t every semester, information on whether
		le for bonus)			
		mination (approx. 90 min oral examination in group			oral examination of one candi- t (approx. 16 pages)
Allocat	tion of <sub>l</sub>	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	ammes)	
	_				
Modul	e appea	ars in			
		ee (1 major) Physics (201	0)		
Master's degree (1 major) Nanostructure Technology (2010)					
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)					
	Jucsi	ee (1 major) FOKUS Physi	cs - Nanostructuring	rechnology (2010)	
Master	-	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi	•	Technology (2010)	
Master Master	's degr		cs (2010)		

Module title					Abbreviation	
Module Type 8I Special Training Interdisciplinary Research				Fields	11-SF-8I-072-m01	
Module	e coord	inator		Module offered by		
-	-	ectors of the Institute of A of Theoretical Physics and		Faculty of Physics a	and Astronomy	
ECTS	Meth	od of grading	Only after succ. con	pl. of module(s)		
8	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Its		•			
Specifi	c, adva	nced knowledge of one o	or more of the Faculty	's current research a	ireas.	
		ning outcomes	,			
The stu terdisc			ed knowledge of one	or more current res	earch areas of the faculty in an in	
Course	<b>S</b> (type, r	number of weekly contact hours, I	language — if other than Ger	man)		
V + R (r	no infoi	rmation on SWS (weekly o	contact hours) and co	urse language avail	able)	
		Sessment (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
		mination (approx. 90 mir oral examination in group			) oral examination of one candi- rt (approx. 16 pages)	
Allocat	ion of	places				
			-			
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
Module	e appea	ars in				
Master's degree (1 major) Physics (2010)						
Master's degree (1 major) Nanostructure Technology (2010)						
	Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)					
	Master's degree (1 major) FOKUS Physics (2010)					
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2006) Master's degree (1 major) FOKUS Physics (2006)						
mastel	s uegi	ee (1 major) FORUS PHYSI	(2000)			

Module title Abbreviation					
Module Type 4N Special Training Nanostructure Technology         11-SF-4N-072-m01					
Module	e coord	inator		Module offered by	
Manag	ing Dire	ector of the Institute	of Applied Physics	Faculty of Physics	and Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
4	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Specifi techno		nced knowledge of o	one or more of the Faculty	's current research a	areas in the field of nanostructure
Intende	ed lear	ning outcomes			
		nave specific and ad tructure technology.	vanced knowledge of one	e or more current res	earch areas of the faculty in the
Course	<b>S</b> (type, r	umber of weekly contact h	ours, language — if other than Ge	rman)	
V + R (r	no infor	mation on SWS (wee	ekly contact hours) and co	ourse language avai	lable)
		s <b>essment</b> (type, scope, l le for bonus)	anguage — if other than German,	examination offered — if n	ot every semester, information on whether
			o minutes) or b) talk (appr roups (approx. 30 minute		) oral examination of one candi- rt (approx. 8 pages)
Allocat	ion of p	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regu	lations for teaching-degree progra	immes)	
Module	e appea	irs in			
	•		ucture Technology (2010)		
			Physics - Nanostructuring Physics - Nanostructuring		

Module title Abbreviation					
Module Type 5N Special Training Nanostructure Technology         11-SF-5N-072-m01					
Module	e coord	inator		Module offered by	,
Manag	ing Dire	ector of the Institute	of Applied Physics	Faculty of Physics	and Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Techno	logy.		one or more of the Faculty	's current research	areas in the field of Nanostructure
Intend	ed learn	ning outcomes			
		nave specific and ad tructure technology.	vanced knowledge of one	e or more current res	search areas of the faculty in the
Course	<b>S</b> (type, n	umber of weekly contact h	ours, language — if other than Ge	rman)	
V + R (r	o infor	mation on SWS (wee	ekly contact hours) and co	ourse language avai	lable)
		<b>essment</b> (type, scope, l le for bonus)	anguage — if other than German,	examination offered — if n	ot every semester, information on whether
			o minutes) or b) talk (appi roups (approx. 30 minute		c) oral examination of one candi- ort (approx. 10 pages)
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regu	lations for teaching-degree progra	immes)	
Module	e appea	irs in			
	-		ucture Technology (2010)		
			Physics - Nanostructuring Physics - Nanostructuring		

Module title Abbreviation						
Module Type 6N Special Training Nanostructure Technology         11-SF-6N-072-m01						
Module	e coord	inator		Module offered by	I	
Manag	ing Dire	ector of the Institute of A	pplied Physics	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Specifi techno		nced knowledge of one	or more of the Faculty	's current research a	reas in the field of nanostructure	
Intende	ed learı	ning outcomes				
		nave specific and advan tructure technology.	ced knowledge of one	or more current res	earch areas of the faculty in the	
Course	<b>S</b> (type, n	umber of weekly contact hours,	language — if other than Ger	man)		
V + R (r	infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)	
		s <b>essment</b> (type, scope, langua le for bonus)	age — if other than German, o	examination offered — if no	ot every semester, information on whether	
		mination (approx. 90 mination in group			) oral examination of one candi- rt (approx. 12 pages)	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	е				
Referre	d to in	LPOI (examination regulation	ns for teaching-degree progra	mmes)		
Module	Module appears in					
	-	ee (1 major) Nanostructu	•, · ·			
	-	ee (1 major) FOKUS Phys ee (1 major) FOKUS Phys				

Module title Abbreviation					
Module Type 8N Special Training Nanostructure Technology         11-SF-8N-072-m01					
Module	e coord	inator		Module offered by	I
Manag	ing Dire	ector of the Institute	of Applied Physics	Faculty of Physics a	and Astronomy
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	· · · · ·
8	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	Its				
Specifi techno		nced knowledge of o	one or more of the Faculty	's current research a	areas in the field of nanostructure
Intend	ed lear	ning outcomes			
		have specific and ad tructure technology.		e or more current res	earch areas of the faculty in the
Course	<b>S</b> (type, r	number of weekly contact h	ours, language — if other than Ge	rman)	
V + R (r	no infor	mation on SWS (wee	ekly contact hours) and co	ourse language avail	able)
		<b>sessment</b> (type, scope, l le for bonus)	anguage — if other than German,	examination offered — if n	ot every semester, information on whether
			o minutes) or b) talk (appr roups (approx. 30 minute	-	) oral examination of one candi- rt (approx. 16 pages)
Allocat	ion of <sub>l</sub>	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regu	lations for teaching-degree progra	ammes)	
Module	e appea	ars in			
			ucture Technology (2010)		
			Physics - Nanostructuring		
Master	's degr	ee (1 major) FOKUS F	Physics - Nanostructuring	Technology (2006)	

Module title         Abbrevi					Abbreviation
Current	Current Topics in Nanostructure Technology 11-EXN5-111-mo1				
Module	e coord	inator		Module offered by	1
chairpe	erson o	f examination committee		Faculty of Physics a	and Astronomy
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate	Approval by examin	ation committee req	uired.
Conten	Its				
Current or stud			Accredited academi	c achievements, e.g	in case of change of university
Intende	ed lear	ning outcomes			
Techno nology	ology of or nan	the Master's programme	. They have knowled nd the measuring and	ge of a current subd l evaluation method	of a module of Nanostructure iscipline of nanostructure tech- s necessary to acquire this know- ication areas.
	-	number of weekly contact hours, l			
V + R (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		<b>sessment</b> (type, scope, langua ile for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether
less oth minute prox. 8 tes)	herwise s per c to 10 p	e specified) or b) oral exa andidate, for modules wi	mination of one canc th less than 4 ECTS c 1 to 4 weeks) or d) pr	lidate each or oral e redits approx. 20 mi	credits approx. 90 minutes; un- xamination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-
Allocat	ion of <sub>l</sub>	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teaching cycle					
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)					
Module	e appea	ars in			
	-	ee (1 major) Nanostructur			
Master	's degr	ee (1 major) Nanostructur	e Technology (2010)		

Module title At					Abbreviation
Current Topics in Nanostructure Technology       11-EXN6-111-mo1					11-EXN6-111-m01
Modul	e coord	inator		Module offered by	1
chairpe	erson o	f examination committee		Faculty of Physics a	and Astronomy
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
6	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate	Approval by examin	ation committee req	uired.
Conten	Its				
Curren or stud			Accredited academi	c achievements, e.g	in case of change of university
Intend	ed lear	ning outcomes			
nology ledge.	or nan They ai	o sciences and understar e able to classify the sub	nd the measuring and ject-specific contexts	evaluation method and know the appli	iscipline of nanostructure tech- s necessary to acquire this know- ication areas.
	_	number of weekly contact hours, l			
V + R (r	no infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		<b>Sessment</b> (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether
less ot minute prox. 8 tes)	herwise s per c to 10 p	e specified) or b) oral exa andidate, for modules wi	mination of one canc th less than 4 ECTS c 1 to 4 weeks) or d) pr	lidate each or oral e redits approx. 20 mi	credits approx. 90 minutes; un- xamination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-
Allocat	ion of	places			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
<u></u>					
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
Modul					
	-	ee (1 major) Nanostructu	•,		
Master	's degr	ee (1 major) Nanostructui	re Technology (2010)		

Module title					Abbreviation	
Current Topics in Nanostructure Technology     11-EXN7-111-m01					11-EXN7-111-m01	
Module	Module coordinator Module offered by					
chairpe	erson o	f examination committee		Faculty of Physics a	and Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
7	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate	Approval by examin	ation committee req	uired.	
Conten	ts					
Current or stud			Accredited academi	c achievements, e.g	. in case of change of university	
Intende	ed lear	ning outcomes				
Techno nology ledge.	logy of or nan They ar	the Master's programme o sciences and understar e able to classify the sub	. They have knowled nd the measuring and ject-specific contexts	ge of a current subd d evaluation method s and know the appli	of a module of Nanostructure iscipline of nanostructure tech- s necessary to acquire this know- ication areas.	
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
V + R (n	io infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		<b>Sessment</b> (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether	
less oth minute prox. 8 tes)	nerwise s per c to 10 p	e specified) or b) oral exa andidate, for modules wi	mination of one canc th less than 4 ECTS c 1 to 4 weeks) or d) pr	lidate each or oral e redits approx. 20 mi	credits approx. 90 minutes; un- xamination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-	
Allocat	ion of <sub>l</sub>	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)						
Module	appea	ars in				
Master	's degr	ee (1 major) Nanostructui	re Technology (2011)			
Master	's degr	ee (1 major) Nanostructu	re Technology (2010)			

Module title Abbreviation					Abbreviation
Curren	Current Topics in Nanostructure Technology 11-EXN8-111-mo1				
Module coordinator Module offered by					I
chairpe	erson o	f examination committee		Faculty of Physics a	and Astronomy
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
8	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ester	graduate	Approval by examin	ation committee req	uired.
Conten	nts				
Current or stud	•		. Accredited academi	c achievements, e.g	. in case of change of university
Intend	ed lear	ning outcomes			
nology ledge.	or nan They ai	o sciences and understar e able to classify the sub	nd the measuring and ject-specific contexts	evaluation method and know the appli	iscipline of nanostructure tech- s necessary to acquire this know- ication areas.
	-	number of weekly contact hours, l			
V + R (r	no info	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		<b>sessment</b> (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether
a) written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; un- less otherwise specified) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (ap- prox. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minu- tes) Language of assessment: German, English					
Allocat	tion of	places			
Additio	onal inf	ormation			
Worklo	bad				
Teachi	ng cycl	e			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	ars in			
	-	ee (1 major) Nanostructui			
Master	's degr	ee (1 major) Nanostructui	re Technology (2010)		

Module title					Abbreviation
Current Topics in Physics					11-EXP5-111-m01
Module coordinator				Module offered by	
chairperson of examination committee				Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate	Approval by examination	ation committee req	uired.
Conten	ts				
		of Experimental and The versity or study abroad.	oretical Physics. Acci	redited academic acl	hievements, e.g. in case of
Intende	ed learı	ning outcomes			
Theoret subdise	tical Ph cipline	ysics of the Master's pro	gramme of Nanostruc nd the measuring and	ture Technology. The location mether the second s	of a module of Experimental or ey have knowledge of a current nods necessary to acquire this application areas.
Course	<b>S</b> (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)	
V + R (n	o infor	mation on SWS (weekly o	contact hours) and co	urse language availa	able)
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
a) written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; un- less otherwise specified) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (ap- prox. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minu- tes) Language of assessment: German, English					
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	e appea	ars in			
	Master's degree (1 major) Nanostructure Technology (2011)				
Master's degree (1 major) Nanostructure Technology (2010)					

Module title					Abbreviation	
Current Topics in Physics				11-EXP6-111-m01		
Module coordinator				Module offered by		
chairpe	rson o	f examination committee		Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate	Approval by examination	ation committee req	uired.	
Conten	ts					
		of Experimental and The /ersity or study abroad.	oretical Physics. Acci	edited academic acl	hievements, e.g. in case of	
Intende	ed learı	ning outcomes				
Theoret subdise	tical Ph cipline	ysics of the Master's pro	gramme of Nanostruc nd the measuring and	ture Technology. The location mether the second s	of a module of Experimental or ey have knowledge of a current nods necessary to acquire this application areas.	
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V + R (n	o infor	mation on SWS (weekly o	contact hours) and co	urse language availa	able)	
		<b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
less oth minutes prox. 8 tes)	a) written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; un- less otherwise specified) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (ap- prox. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minu- tes) Language of assessment: German, English					
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ng cycl	e				
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)						
Module	appea	in				
Master' Master'	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) FOKUS Physics (2011)					

Module title					Abbreviation
Current Topics in Physics					11-EXP7-111-m01
Module coordinator				Module offered by	
chairpe	rson o	f examination committee		Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
7	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate	Approval by examination	ation committee req	uired.
Conten	ts				
		of Experimental and The versity or study abroad.	oretical Physics. Accı	redited academic ac	hievements, e.g. in case of
Intende	ed learı	ning outcomes			
Theoret subdise	tical Ph cipline	ysics of the Master's pro	gramme of Nanostruc nd the measuring and	ture Technology. Th /or calculation meth	of a module of Experimental or ey have knowledge of a current nods necessary to acquire this application areas.
Course	<b>S</b> (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)	
V + R (n	o infor	mation on SWS (weekly o	contact hours) and co	urse language availa	able)
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
a) written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; un- less otherwise specified) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (ap- prox. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minu- tes) Language of assessment: German, English					
Allocat					
Additio	nal inf	ormation			
Worklo	ad				
Teaching cycle					
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)					
Module	appea	irs in			
	Master's degree (1 major) Nanostructure Technology (2011)				
Master's degree (1 major) Nanostructure Technology (2010)					

Module title					Abbreviation
Current Topics in Physics					11-EXP8-111-m01
Module coordinator				Module offered by	
chairpe	rson o	f examination committee		Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
8	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate	Approval by examination	ation committee req	uired.
Conten	ts				
		of Experimental and The versity or study abroad.	oretical Physics. Acci	redited academic acl	hievements, e.g. in case of
Intende	ed learı	ning outcomes			
Theoret subdise	tical Ph cipline	ysics of the Master's pro	gramme of Nanostruc nd the measuring and	ture Technology. The location mether the second s	of a module of Experimental or ey have knowledge of a current nods necessary to acquire this application areas.
		number of weekly contact hours, l	· · ·		
V + R (n	o infor	mation on SWS (weekly o	contact hours) and co	urse language availa	able)
		<b>sessment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
a) written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; un- less otherwise specified) or b) oral examination of one candidate each or oral examination in groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (ap- prox. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minu- tes) Language of assessment: German, English					
Allocat					
Additio	nal inf	ormation			
Worklo	ad				
Teaching cycle					
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)					
Module	appea	in in			
	Master's degree (1 major) Nanostructure Technology (2011)				
Master's degree (1 major) Nanostructure Technology (2010)					



# **Compulsory Electives Non-technical** (6 ECTS credits)

Students must take a minimum of one module.

Module title					Abbreviation	
Geophysics for Students of Physics and Engineering					09-BFA4-082-m01	
Module coordinator				Module offered by		
holder	of the F	Professorship of Physical	Geography	Institute of Geograp	Institute of Geography and Geology	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Introdu	ction to	o "Geophysics, Physical F	Properties of Geomate	erials, Methods of Ap	oplied Geophysics".	
Intende	ed learr	ning outcomes				
		sess the following skills:   of ground-based and geo			h, physical geomaterials science	
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
compoi • 0	nent. 9-BFA4	omprises 2 module comp 1-1-082: V (no information 1-2-082: V (no information	n on SWS (weekly cor	itact hours) and cou		
Method	l of ass		. ,	·	t every semester, information on whether	
	less st	ated otherwise, successf			e components as specified be- successful completion of all indi-	
<ul> <li>Assessment in module component og-BFA4-1-o82: Introduction to Geophysics <ul> <li>3 ECTS, Method of grading: numerical grade</li> <li>term paper (approx. 3 to 5 pages)</li> </ul> </li> <li>Assessment in module component og-BFA4-2-o82: Methods of Applied Geophysics <ul> <li>3 ECTS, Method of grading: numerical grade</li> <li>oral examination of one candidate each (approx. 10 minutes)</li> </ul> </li> </ul>						
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
Teaching cycle						
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)						
Module appears in						
Bachelo	Bachelor' degree (1 major) Physics (2010)					
	-	ree (1 major) Physics (201	-			
Master's degree (1 major) Nanostructure Technology (2010)						

Module title					Abbreviation
Basic module: Competence for Acquiring Information - for students of natural sciences					41-IK-NW1-072-m01
Module coordinator				Module offered by	
head of	Unive	rsity Library		University Library	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
1	(not) s	uccessfully completed			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Content	ts				
- Search - Using - Resou - Online - Overvi - Refere	n strate the lib rces fo e searcl ew of a nce ma	eracy in an academic cor gies and tools. rary's electronic resource r natural sciences: datab nes and search engines. additional resources (eLe anagement. Some section in the natural sciences).	s. ases and journals. arning etc.).	focus on particular o	disciplines (wherever possible,
Intende	d lear	ning outcomes			
Students know what information is needed for what purpose. They are able to locate information that is relevant within their discipline and beyond in a variety of resources and to evaluate this information. They recognise the difference in quality between information they have retrieved from specific, restricted access resources (databases) and information they have found on the free web. Students are able to manage and process the information they have found, using reference management software and eLearning tools. The module aims to equip students with the skills needed to find information and literature that is relevant to the topics of their Bachelor's theses.					
		umber of weekly contact hours, la			
		ion on SWS (weekly cont			a)
Method	l of ass	· · · ·			t every semester, information on whether
written	examir	nation (60 minutes)			
Allocati					
Additio	nal info	ormation			
Workloa	ad				
Teachin	ig cycl	9			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master' Master'	Module appears in Bachelor' degree (1 major) Chemistry (2007) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2006)				

Module title					Abbreviation	
Second module: Competence for Acquiring Information - for students of natu-					41-IK-NW2-072-m01	
ral scie	nces					
Module coordinator				Module offered by		
head of University Library				University Library		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
2	r	ical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Information literacy in an academic context: - More in-depth discussion of selected topics that were covered in the level one module, e. g. searching sub- ject-specific databases Publishing and information practices in the natural sciences Subject-specific information retrieval tools, e. g. classifications and thesauri New web-based information and communication technologies Searching for subject-specific facts (e. g. substances and physical data) Information search skills for the workplace Copyright and citations Electronic publishing. Some sessions will focus on particular disciplines (wherever possible, on disciplines in the natural sciences). Intended learning outcomes Students have developed a differentiated understanding of the publishing and information practices in their discipline and are familiar with the possibilities offered by electronic publishing. They are able to use electronic tools to locate subject-specific facts in a variety of resources. Students are able to work with subject-specific information retrieval tools as well as to use new web-based technologies to share information. They have developed						
		text and are able to use in umber of weekly contact hours, la	· · · · ·	•		
		ion on SWS (weekly cont			.)	
Method module is	l <b>of ass</b> creditab				t every semester, information on whether	
Allocati	on of p	laces				
Additio	nal info	ormation				
Worklo	ad					
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	rs in				
Master'	s degre	ree (1 major) Chemistry (2 ee (1 major) Nanostructur ee (1 major) FOKUS Physic	e Technology (2010)	Fechnology (2010)		



Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2006)

Modul	e title				Abbreviation
Geoph	ysics f	or Students of Physics a	nd Engineering		09-BFA3-Phy-082-m01
Modul	e coord	linator		Module offered by	1
holder	ofthe	Professorship of Physica	l Geography	Institute of Geogra	phy and Geology
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	erical grade			
Durati	on	Module level	Other prerequisites		
1 seme	ester	undergraduate			
Conter	nts				
Introdu	uction t	o "Geophysics, Physical	Properties of Geomat	erials"	
Intend	ed lear	ning outcomes			
Studer als sci		sess the following skills:	physical key process	es of the system ea	th as well as physical geomateri-
Course	es (type,	number of weekly contact hours,	language — if other than Ge	rman)	
V (no i	nforma	tion on SWS (weekly con	tact hours) and cours	e language availabl	e)
		<b>sessment</b> (type, scope, langu ole for bonus)	age — if other than German,	examination offered — if n	ot every semester, information on whether
		nation (approx. 30 minut	tes)		
Allocat					
Additio	onal inf	formation			
			_		
Worklo	bad				
			_		
Teachi	ng cyc	le			
Referre	ed to in	<b>LPO I</b> (examination regulation	ns for teaching-degree progra	ummes)	
Modul	e appe	ars in			
Bache	lor' deg	gree (1 major) Physics (20			
	-	ree (1 major) Physics (20 ree (1 major) Nanostructu	-		

Module	e title				Abbreviation	
Intercu	ultural (	Competence (English, A	dvanced Level)		42-ENO-IK-072-mo	1
Module	e coord	inator		Module offered by		
head o	of Langu	age Centre (ZFS)		Language Centre (ZfS)		
ECTS		od of grading	Only after succ. compl. of module(s)			
3	1	rical grade	42-ENM2 or 42-ENM3 or 42-ENM4 or assessment test			
Duratio		Module level	Other prerequisites			
1 seme		undergraduate				
Conten			1			
This m cultura	odule e al situat	quips students with kno ions. It familiarises the n to adequately interpre	n with criteria and opt	ions for action and e	equips them with kno	
Intend	ed lear	ning outcomes				
level "E Commo	B2 Va on Euro	e target language, both ntage" and aims to ena pean Framework of Refe number of weekly contact hours	ble students to reach erence for Languages.	level "C1 Effective		
Ü (no i	nforma	tion on SWS (weekly co	ntact hours) and cours	e language availabl	e)	
		<b>Sessment</b> (type, scope, langu Ile for bonus)	age — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
compre tes tota weight	ehensio al) as w ed 1:1;	itten multi-component e on, listening comprehen ell as 2 to 4 written ass options will be selected ssessment: English	sion, writing) or option essments (approx. 10	n 3: 2 to 4 oral asses to 15 pages total), al	sments (approx. 30 l components/asses	to 60 minu- sments each
	tion of p					
		ices: 5-25. Places will be	allocated by lot			
		ormation				
			_			
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	ummes)		
Module	e appea	ars in				
		ree (1 major) Chemistry	(2009)			
	-	ree (1 major) Computer				
	-	ree (1 major) Business N	-	-		
	-	ree (1 major) Business N	-	omics (2010)		
		ree (1 major) Economatl ree (1 major) Economatl				
Datie	ivi ucg		1.110111.3 120001			
	-	-		2009)		
Bachel	lor' deg	ree (1 major) Business I	nformation Systems (2	2009) generated 26-Aug-2024 • ex	am. reg. da-	page 183 / 268

Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) Magister Theologiae Catholic Theology (2009) No final examination Special study offering (2010)

Module	e title				Abbreviation	
Cultura	l Studi	es (English, Advanced	Level)		42-ENO-LK-072-mo	1
Module	e coord	inator		Module offered by		
head of	f Langu	age Centre (ZFS)		Language Centre (Z	fS)	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
3	nume	rical grade	42-ENM2 or 42-ENM	3 or 42-ENM4 or ass	essment test	
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate	 			
Conten						
This mo and thu	odule fa us enat	amiliarises students wi bles them to act approp cal system, and the eco	riately in the target lan	guage. It discusses t		
Intende	ed lear	ning outcomes				
countri in a var dents a workpla Operati	Students develop highly advanced language skills and a thorough familiarity with the culture and society of countries where the target language is spoken. They are thus able to communicate, both verbally and in writing, in a variety of situations, taking into account aspects related to the culture and society of said countries. Students are able to effectively and flexibly use the target language, both during study abroad periods and in the workplace. This module builds on level "B2 Vantage" and aims to enable students to reach level "C1 Effective Operational Proficiency" of the Common European Framework of Reference for Languages.					
		number of weekly contact hours			.)	
		tion on SWS (weekly co				
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
hension nutes) compre tes tota weighte	n, lister and wr ehensic al) as w ed 1:1;	en multi-component ex ning comprehension, w itten multi-component on, listening compreher ell as 2 to 4 written ass options will be selected ssessment: English	riting, communication examination (approx. 6 ision, writing) or option essments (approx. 10	skills) or option 2: o o to 90 minutes tota 1 3: 2 to 4 oral asses to 15 pages total), all	ral assessment (app al) with 3 component sments (approx. 30 components/asses	rox. 10 mi- ts (reading to 60 minu- sments each
Allocat	ion of p	olaces				
Numbe	r of pla	ces: 5-25. Places will b	e allocated by lot.			
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cvcl	e				
	<u> </u>					
Roforro	d to in	LPO I (examination regulation	ne for toaching dogroo progra	mmoc)		
Module	e appea	irs in				
Bachel	or' deg	ree (1 major) Chemistry				
		ree (1 major) Computer				
	-	ree (1 major) Business I	-	-		
		ree (1 major) Business   ree (1 major) Economat		omics (2010)		
		ree (1 major) Economat ree (1 major) Economat				
		r Nanostructure Technology		generated 26-Aug-2024 • example 2024	am. reg. da-	page 185 / 268
(2010)	.,-		-	r (120 ECTS) Nanostrukturtec	-	

Bachelor' degree (1 major) Business Information Systems (2009) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) Magister Theologiae Catholic Theology (2009) No final examination Special study offering (2010)

Module title Al	bbreviation			
Advanced English Final Exam 42	2-ENO-PR-072-m01			
Module coordinator Module offered by				
head of Language Centre (ZFS) Language Centre (ZfS)	)			
ECTS Method of grading Only after succ. compl. of module(s)				
2 numerical grade				
Duration Module level Other prerequisites				
1 semester undergraduate Registration for assessment: as specified.				
Contents				
Final exam in the upper level of the target language.				
Intended learning outcomes				
In this exam, students will be expected to demonstrate language skills that are equ Operational Proficiency" of the Common European Framework of Reference for Lang the exam may obtain a UNIcert(R) Level III certificate once the university has been a	nguages. Students who passed			
<b>Courses</b> (type, number of weekly contact hours, language $-$ if other than German)				
no courses assigned				
<b>Method of assessment</b> (type, scope, language – if other than German, examination offered – if not ev	every semester, information on whether			
module is creditable for bonus) written and oral examination (200 to 210 minutes total) testing the candidate's ski				
reading and listening comprehension, writing and oral communication skills; only successfully completed will assessment be considered successfully completed Language of assessment: English Assessment offered: once a year (autumn, semester break)				
Allocation of places				
Additional information				
Workload				
Teaching cycle				
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)				
Module appears in				
Bachelor' degree (1 major) Chemistry (2009)				
Bachelor' degree (1 major) Computer Science (2010)				
Bachelor' degree (1 major) Business Management and Economics (2009)				
Bachelor' degree (1 major) Business Management and Economics (2010) Bachelor' degree (1 major) Economathematics (2009)				
Bachelor' degree (1 major) Economathematics (2009)				
Bachelor' degree (1 major) Business Information Systems (2009)				
Master's degree (1 major) Nanostructure Technology (2010)				
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)				
Bachelor's degree (1 major, 1 minor) Pedagogy (2009)				
Magister Theologiae Catholic Theology (2009)				

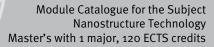
	e title				Abbreviation		
English	n for th	e Natural Sciences 1 (Ad	lvanced Level)		42-ENO-NW1-072-r	n01	
Module	e coord	inator		Module offered by	l		
head o	f Langu	lage Centre (ZFS)		Language Centre (Z	ZfS)		
ECTS		od of grading	Only after succ. con	y after succ. compl. of module(s)			
4	1	rical grade		M2 or 42-ENM3 or 42-ENM4 or assessment test			
 Duratio		Module level	Other prerequisites				
1 seme		undergraduate					
Conten							
This m	odule e	equips students with adv ate appropriately, in bot				l allow them	
		ning outcomes					
lected gy and ped na	topics i are ab tural so	advanced natural scien in corresponding situati le to communicate effec ciences-specific languag n European Framework	ons, using language fl tively within the discip ge skills that are equiv	exibly. Students are bline. At the end of t alent to level "C1 E	proficient in scienti he stage, they will h	fic terminolo- ave develo-	
Course	<b>S</b> (type, r	number of weekly contact hours	, language — if other than Gei	rman)			
Ü + Ü (	no info	rmation on SWS (weekly	contact hours) and co	ourse language avai	lable)		
	<b>d of ass</b> s creditab	<b>Sessment</b> (type, scope, langu	age — if other than German,	examination offered — if no	ot every semester, informat	tion on whether	
option hensio	1: writt n, liste	en multi-component exa ning comprehension, wi itten multi-component e	riting, communication	skills) or option 2: 0	oral assessment (app	orox. 10 mi-	
option hensio nutes) compre tes tota weight Langua	1: writt n, liste and wr ehensic al) as w ed 1:1; ige of a	en multi-component exa ning comprehension, wi	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date	skills) or option 2: o 60 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	orox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre tes tota weight Langua	1: writt n, liste and wr ehensic al) as w ed 1:1; age of a ment o	en multi-component exa ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asso options will be selected ssessment: English ffered: once a year, win	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date	skills) or option 2: o 60 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	orox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre- tes tota weight Langua Assess Allocat	1: writt n, liste and wr ehensic al) as w ed 1:1; nge of a ment o <b>ion of </b>	en multi-component exa ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asso options will be selected ssessment: English ffered: once a year, win	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 60 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	orox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre- tes tota weight Langua Assess <b>Allocat</b>	1: writt n, liste and wr ehensic al) as w ed 1:1; age of a ment o <b>ion of</b> pla	en multi-component exa ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asso options will be selected ssessment: English ffered: once a year, win <b>places</b>	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 60 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	prox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre tes tota weight Langua Assess Allocat Numbe	1: writt n, liste and wr ehensid al) as w ed 1:1; nge of a ment o <b>ion of</b> p er of pla	en multi-component exa ning comprehension, wi itten multi-component ec on, listening comprehen rell as 2 to 4 written asso options will be selected ssessment: English ffered: once a year, win <b>places</b> acces: 5-25. Places will be	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 60 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	orox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre tes tota weight Langua Assess <b>Allocat</b>	1: writt n, liste and wr ehensid al) as w ed 1:1; nge of a ment o <b>ion of</b> p er of pla	en multi-component exa ning comprehension, wi itten multi-component ec on, listening comprehen rell as 2 to 4 written asso options will be selected ssessment: English ffered: once a year, win <b>places</b> acces: 5-25. Places will be	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 50 to 90 minutes tot n 3: 2 to 4 oral asses to 15 pages total), al	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	orox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre- tes tota weight Langua Assess Allocat Numbe Additio	1: writt n, liste and wr ehensio al) as w ed 1:1; ige of a ment o ion of pla onal inf	en multi-component exa ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asso options will be selected ssessment: English ffered: once a year, win <b>places</b> aces: 5-25. Places will be <b>ormation</b>	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 50 to 90 minutes tot n 3: 2 to 4 oral asses to 15 pages total), al	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	orox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre tes tota weight Langua Assess <b>Allocat</b> Numbe	1: writt n, liste and wr ehensio al) as w ed 1:1; ige of a ment o ion of pla onal inf	en multi-component exa ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asso options will be selected ssessment: English ffered: once a year, win <b>places</b> aces: 5-25. Places will be <b>ormation</b>	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 50 to 90 minutes tot n 3: 2 to 4 oral asses to 15 pages total), al	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	orox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre- tes tota weight Langua Assess Allocat Numbe Additio  Worklo  Teachin	1: writt n, liste and wr ehensio al) as w ed 1:1; ge of a ment o ion of pla onal inf mad	en multi-component exa ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asso options will be selected ssessment: English ffered: once a year, win <b>places</b> aces: 5-25. Places will be <b>ormation</b>	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 f and examination date ter semester e allocated by lot.	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al es be fixed at the be	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	prox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre- tes tota weight Langua Assess Allocat Numbe Additio  Worklo  Teachin	1: writt n, liste and wr ehensio al) as w ed 1:1; ge of a ment o ion of pla onal inf mad	en multi-component exa ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asse options will be selected issessment: English ffered: once a year, win places aces: 5-25. Places will be ormation	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 f and examination date ter semester e allocated by lot.	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al es be fixed at the be	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	prox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre- tes tota weight Langua Assess Allocat Numbe Additio  Worklo  Teachin	1: writt n, liste and wr ehensic al) as w ed 1:1; age of a ment o ion of pla onal inf pad	en multi-component exa ning comprehension, wi itten multi-component exa on, listening comprehen rell as 2 to 4 written asse options will be selected ssessment: English ffered: once a year, win <b>places</b> acces: 5-25. Places will be <b>ormation</b> <b>e</b> <b>LPO I</b> (examination regulatio	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 f and examination date ter semester e allocated by lot.	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al es be fixed at the be	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	prox. 10 mi- its (reading to 60 minu- ssments each	
option hensio nutes) compre- tes tota weight Langua Assess Allocat Numbe Additio  Worklo  Teachin  Referre  Bachel Bachel Bachel Bachel Bachel	1: writt n, liste and wr ehensic al) as w ed 1:1; age of a ment o ion of p er of pla onal inf ad ad ad ad ad ad ad ad ad ad ad ad ad	en multi-component exa ning comprehension, wi itten multi-component exa on, listening comprehen rell as 2 to 4 written asse options will be selected ssessment: English ffered: once a year, win <b>places</b> acces: 5-25. Places will be <b>ormation</b> <b>e</b> <b>LPO I</b> (examination regulatio	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 f and examination date ter semester e allocated by lot. e allocated by lot. (2009) Science (2010) nematics (2009) nematics (2008)	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al es be fixed at the be	val assessment (app al) with 3 componen ssments (approx. 30 l components/asses	prox. 10 mi- its (reading to 60 minu- ssments each	
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Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) No final examination Special study offering (2010)

Fnolick	e title				Abbreviation		
English for the Natural Sciences 2 (Advanced Level)					42-ENO-NW2-072-r	m01	
Module	e coord	inator		Module offered by	<u> </u>		
		age Centre (ZFS)		Language Centre (Z	fS)		
ECTS	1	od of grading	Only after succ. compl. of module(s)				
		rical grade		42-ENM2 or 42-ENM3 or 42-ENM4 or assessment test			
4 Duratio		Module level	Other prerequisites				
1 seme		undergraduate		•			
		undergraduate					
Conten						1 - 11 41	
		quips students with ad te appropriately, in bot				l allow them	
Intende	ed lear	ning outcomes					
lected t gy and ped na	topics i are abl tural so	advanced natural scien n corresponding situati e to communicate effec iences-specific languas n European Framework	ions, using language fl ctively within the disci ge skills that are equiv	exibly. Students are oline. At the end of tl alent to level "C1 E	proficient in scientine stage, they will have	fic terminolo- ave develo-	
		umber of weekly contact hours					
	-	rmation on SWS (weekl			able)		
		essment (type, scope, lang	<u> </u>			tion on whothor	
		le for bonus)	uage — II other than German,		it every semester, mormat	lion on whether	
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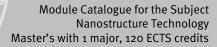




Bachelor's degree (1 major, 1 minor) Pedagogy (2009) No final examination Special study offering (2010)

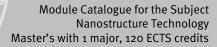
French for the Humanities 1 (Advanced Level)       42-FR0-GW1-072-m01         Module coordinator       Module offered by         Language Centre (ZFS)       Language Centre (ZFS)         ECTS       Method of grading       Only after succ. compl. of module(s)         4       numerical grade       42-FRM2 or 42-FRM3 or 42-FRM4 or assessment test         Duration       Module level       Other prerequisites         1 semester       undergraduate          Contents       This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriately, in both written and oral form, at university and in business settings.         Interned learning outcomes       Students gain sound humanities-specific communication skills (written and oral) in the target language. They develop advanced humanities-specific language skills that will allow them to communicate about selected topics in corresponding situations, using language flexibly. Students are proficient in humanities terminology and are able to communicate effectively within the discipline. At the end of the stage, they will have developed humanities-specific language skills that are equivalent to level 'C1 - Effective Operational Proficiency'' of the Common European Famework of Reference for Language. Tother than German)         U (no information on SWS (weekly contact hours) and course language available)         Method of assessment (prop, scop, language – if other than German)         U (no information on SWS (weekly contact hours) and course language available)     <	Module ti	tle			Abbreviation		
head of Language Centre (ZFS)       Language Centre (ZFS)         ECTS       Method of grading       Only after succ. compl. of module(s)         4       numerical grade       42-FRM3 or 42-FRM3 or 42-FRM4 or assessment test         Duration       Module level       Other prerequisites         1 semester       undergraduate          Contents           This module equips students with advanced communication skills in the target language. They devolo advanced humanities-specific communication skills (written and oral) in the target language. They devolo advanced humanities-specific communication skills (written and oral) in the target language. They devolo advanced humanities-specific communication skills (written and oral) in the target language. They devolo advanced humanities-specific communication skills (written and oral) in the target language. They devolo advanced humanities-specific language skills that are equivalent to level 'C1 Effective Operational Proficiency" of the Common European Framework of Reference for Languages.         Courses (use, number of weekly contact hours, language = if other than Geman)       0         0 (no information on SWS (weekly contact hours) and course language available)         Method of assessment (type, scope, language = if other than Geman).       0         0 (no information on SWS (weekly contact hours) and course language available)       Method of assessments (approx. to on intues total) with a components (reading comprehension, writing, or oprehension, skills) or option 2: oral assessment (approx. to to a prage state hor walls) co	French for	r the Humanities 1 (Advance	ed Level)		42-FRO-GW1-072-m	101	
ECTS         Method of grading         Only after succ. compl. of module(s)           1 numerical grade         42-FRM3 or 42-FRM3 or 42-FRM4 or assessment test           Duration         Module level         Other prerequisites           1 semester         undergraduate            Contents             This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriately, in both written and oral form, at university and in business settings.           Intended learning outcomes            Students gain sound humanities-specific communication skills (written and oral) in the target language. They developed humanities-specific language skills that will allow them to communicate about selected topics in corresponding situations, using language flexibly. Students are proficient in humanities terminology and are able to communicate effectively within the discipline. At the end of the stage, they will have developed humanities-specific language skills that are equivalent to level "C1 - Effective Operational Proficiency" of the Common European Framework of Reference for Languages.           Courses (type, number of weekly contact hours) and course language available)           Method of assessment (type, scope, language – if other than German)           0 (no information on SWS (weekly contact hours) and course language available)           method of assessment (type, scope, language – if other than German).           0 (an information (listoping comprehension, writing) or option 3: 2 to 4 a	Module co	oordinator		Module offered by	<u>I</u>		
4       numerical grade       42-FRM2 or 42-FRM3 or 42-FRM4 or assessment test         Duration       Module level       Other prerequisites         1 semester       undergraduate          Contents           This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriately, in both written and oral form, at university and in business settings.         Intended learning outcomes          Students gain sound humanities-specific anguage flexibly. Students are proficient in humanities terminology and are able to communicate effectively within the discipline. At the end of the stage, they will have developed humanities-specific language skills that are equivalent to level "C1 Effective Operational Proficiency" of the Common European Framework of Reference for Languages.         Courses (type, number of weekly contact hours, language if other than German)       0         0 (no information on SWS (weekly contact hours) and course language available)       Method of assessment (type, scope, language if other than German)         0 (no information on SWS (weekly contact hours) and course language available)       Method of assessment (type, scope, language if other than German)         0 (no information on SWS (weekly contact hours) and course language available)       Method f assessment (type, scope, language if other than German)         0 (no information on SWS (weekly contact hours, language)       oral assessconter, information on whether modules cerditable for b	head of La	anguage Centre (ZFS)		Language Centre (Z	(fS)		
Duration         Module level         Other prerequisites           1 semester         undergraduate	ECTS M	lethod of grading	Only after succ. con	c. compl. of module(s)			
Duration         Module level         Other prerequisites           1 semester         undergraduate	4 ni	umerical grade	42-FRM2 or 42-FRM	-FRM2 or 42-FRM3 or 42-FRM4 or assessment test			
1 semester undergraduate	· · ·		Other prerequisites	<u> </u>			
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This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriately, in both written and oral form, at university and in business settings. Intendel learning outcomes Students gain sound humanities-specific communication skills (written and oral) in the target language. They de velop advanced humanities-specific language skills that will allow them to communicate about selected topics in corresponding situations, using language flexibly. Students are proficient in humanities terminology and are able to communicate effectively within the discipline. At the end of the stage, they will have developed humanities-specific language skills that are equivalent to level "C1 ~ Effective Operational Proficiency" of the Common European Framework of Reference for Languages. Courses (ype, number of weekly contact hours, language – if other than Geman) Ü (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than Geman, examination offered – if not every semester, information on whether module is creditable for hours) Option 1: written multi-component examination (approx. 90 minutes total) with 4 components (reading comprehension, writing, communication skills) or option 2: oral assessment (approx. 10 minutes total) as well as 2 to 4 written assessments (approx. 10 to 15 pages total), all components (reading comprehension, writing, or option 3: 2 to 4 oral assessments (approx. 20 to 6 on injutes total) as well as 2 to 4 written assessments (approx. 10 to 15 pages total), all components (reading comprehension, ilstening comprehension, writing) or option 3: 2 to 4 oral assessments (approx. 20 to 6 on injutes total) as well as 2 to 4 written assessments (approx. 10 to 15 pages total), all components/assessments each weighted 1:1; options will be selected and examination dates be fixed at the beginning of the course Language of assessment: French Assessment offered: once a year, winter							
Intended learning outcomes Students gain sound humanities-specific communication skills (written and oral) in the target language. They de velop advanced humanities-specific language skills that will allow them to communicate about selected topics in corresponding situations, using language flexibly. Students are proficient in humanities terminology and are able to communicate effectively within the discipline. At the end of the stage, they will have developed humani- ties-specific language skills that are equivalent to level "C1 Effective Operational Proficiency" of the Common European Framework of Reference for Languages. Courses (type, number of weekly contact hours, language – if other than Geman) 0 (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than Geman, examination offered – if not every semester, information on whether module is creditable for bonus) option 1: written multi-component examination (approx. 90 minutes total) with 4 components (reading compre- hension, listening comprehension, writing, communication skills) or option 2: oral assessment (approx. 10 mi- nutes) and written multi-component examination (approx. 10 to 5 pages total), all components (reading comprehension, listening comprehension, writing) or option 3: 2 to 4 oral assessments (approx. 30 to 6 on inu- tes total) as well as 2 to 4 written assessments (approx. 10 to 5 pages total), all components/assessment each weighted 1::, options will be selected and examination dates be fixed at the beginning of the course Language of assessment: French Assessment offered: once a year, winter semester Motocad	This modu					l allow them	
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Allocation of places         Number of places: 5-25. Places will be allocated by lot.         Additional information            Workload            Teaching cycle            Referred to in LPO I (examination regulations for teaching-degree programmes)            Module appears in         Bachelor' degree (1 major) Economathematics (2009)         Bachelor' degree (1 major) Economathematics (2008)         Master's degree (1 major) Nanostructure Technology (2011)         Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)         Bachelor's degree (1 major, 1 minor) Pedagogy (2009)	comprehe tes total) a weighted Language	ension, listening compreher as well as 2 to 4 written ass 1:1; options will be selected of assessment: French	nsion, writing) or option essments (approx. 10 d and examination date	n 3: 2 to 4 oral asses to 15 pages total), al	sments (approx. 30 l components/asses	to 60 minu- sments each	
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Additional information            Workload            Teaching cycle            Referred to in LPO I (examination regulations for teaching-degree programmes)            Module appears in         Bachelor' degree (1 major) Economathematics (2009)         Bachelor' degree (1 major) Economathematics (2008)         Master's degree (1 major) Nanostructure Technology (2011)         Master's degree (1 major) Nanostructure Technology (2010)         Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)         Bachelor's degree (1 major, 1 minor) Pedagogy (2009)			e allocated by lot				
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<ul> <li>Referred to in LPO I (examination regulations for teaching-degree programmes)</li> <li>Module appears in</li> <li>Bachelor' degree (1 major) Economathematics (2009)</li> <li>Bachelor' degree (1 major) Economathematics (2008)</li> <li>Master's degree (1 major) Nanostructure Technology (2011)</li> <li>Master's degree (1 major) Nanostructure Technology (2010)</li> <li>Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)</li> <li>Bachelor's degree (1 major, 1 minor) Pedagogy (2009)</li> </ul>	Workload						
<ul> <li>Referred to in LPO I (examination regulations for teaching-degree programmes)</li> <li>Module appears in</li> <li>Bachelor' degree (1 major) Economathematics (2009)</li> <li>Bachelor' degree (1 major) Economathematics (2008)</li> <li>Master's degree (1 major) Nanostructure Technology (2011)</li> <li>Master's degree (1 major) Nanostructure Technology (2010)</li> <li>Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)</li> <li>Bachelor's degree (1 major, 1 minor) Pedagogy (2009)</li> </ul>							
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				generated 26-Aug-2024 • ex	am. reg. da-	page 192 / 268	



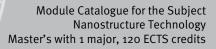


Module head of ECTS 4	for the				Abbreviation		
head of <b>ECTS</b> 4		Humanities 2 (Advance	ed Level)		42-FRO-GW2-072-m	101	
<b>ECTS</b> 4	coord	inator		Module offered by			
4	Langu	age Centre (ZFS)		Language Centre (Z	(fS)		
	Metho	od of grading	Only after succ. con	. compl. of module(s)			
	nume	rical grade	42-FRM2 or 42-FRM	2-FRM2 or 42-FRM3 or 42-FRM4 or assessment test			
Duration Module level Other prerequisites				<u> </u>			
1 semes	ster	undergraduate	, <u>,</u>				
Content			<u> </u>				
This mo	dule e	quips students with ad te appropriately, in bot				allow them	
		ning outcomes		,			
in corre able to ties-spe	spond comm ecific la	ed humanities-specific ing situations, using la unicate effectively with anguage skills that are nework of Reference fo	nguage flexibly. Studer in the discipline. At the equivalent to level "C1	nts are proficient in l e end of the stage, th	numanities terminolo ney will have develop	ogy and are bed humani-	
Courses	<b>5</b> (type, r	umber of weekly contact hours	s, language — if other than Ger	rman)			
Ü (no in	format	tion on SWS (weekly co	ntact hours) and cours	e language available	e)		
		s <b>essment</b> (type, scope, lang le for bonus)	uage — if other than German, o	examination offered — if no	ot every semester, informat	ion on whether	
compre tes tota weighte Langua	hensic l) as w ed 1:1; ge of a	itten multi-component on, listening compreher ell as 2 to 4 written ass options will be selected ssessment: French	nsion, writing) or option essments (approx. 10 t and examination date	n 3: 2 to 4 oral asses to 15 pages total), al	sments (approx. 30 l components/asses	to 60 minu- sments each	
Allocati		ffered: once a year, sur					
		.ces: 5-25. Places will b	e allocated by lot				
	· ·	ormation					
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 Teachin 			ons for teaching-degree progra	Immes)			
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 <b>Teachin</b>  <b>Referre</b>  <b>Module</b> Bachelo Master' Master'	d to in appea or' deg or' deg s degra s degra	LPO I (examination regulation ars in ree (1 major) Economat ree (1 major) Economat ree (1 major) Nanostruct ree (1 major) Nanostruct	hematics (2009) hematics (2008) ure Technology (2011) ure Technology (2010)				
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Intercu	e title				Abbreviation	
Intercultural Competence (French, Advanced Level) 42-FRO-IK-072-mo1					42-FRO-IK-072-m01	
Module	e coord	inator		Module offered by		
head o	f Langu	lage Centre (ZFS)		Language Centre (ZfS)		
ECTS	1	od of grading	Only after succ. compl. of module(s)			
3	1	rical grade	42-FRM2 or 42-FRM3 or 42-FRM4 or assessment test			
-	Duration Module level Other prerequisites					
1 seme		undergraduate				
Conten			1			
This mo cultura	odule e l situat	quips students with kno ions. It familiarises them n to adequately interpret	n with criteria and opt	ions for action and e	quips them with kno	
Intende	ed lear	ning outcomes				
flexibly level "E Commo	v use th 32 Va on Euro	ng, in a globalised world e target language, both ntage" and aims to enab pean Framework of Refe	during study abroad p le students to reach l rence for Languages.	periods and in the we level "C1 Effective	orkplace. This modul	e builds on
Course	<b>S</b> (type, r	number of weekly contact hours,	language — if other than Ger	rman)		
Ü (no ir	nforma	tion on SWS (weekly con	tact hours) and cours	e language availabl	e)	
		<b>Sessment</b> (type, scope, langua Ile for bonus)	age — if other than German,	examination offered — if no	ot every semester, informati	on on whether
nutes) compre tes tota weighte	and wr ehensic al) as w ed 1:1;	ning comprehension, wri itten multi-component ex on, listening comprehens rell as 2 to 4 written asse options will be selected ssessment: French	xamination (approx. 6 sion, writing) or option ssments (approx. 10	50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	al) with 3 component sments (approx. 30 l components/asses	ts (reading to 60 minu-
		places				
	er of pla	olaces Joces: 5-25. Places will be	allocated by lot.			
Numbe		ices: 5-25. Places will be	allocated by lot.			
Numbe			allocated by lot.			
Numbe Additio	onal inf	ices: 5-25. Places will be	allocated by lot.			
Numbe	onal inf	ices: 5-25. Places will be	allocated by lot.			
Numbe Additio  Worklo	onal inf	ices: 5-25. Places will be ormation	allocated by lot.			
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Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) Magister Theologiae Catholic Theology (2009) No final examination Special study offering (2010)

Module title					Abbreviation	
Intercu	ltural (	Competence (French, A	dvanced Level)		42-FRO-LK-072-m01	L
Module	e coord	inator		Module offered by		
head of	f Langu	lage Centre (ZFS)		Language Centre (Z	fS)	
ECTS	Methe	od of grading	Only after succ. con	npl. of module(s)		
3 numerical grade 42-FRM2 or 42-FRM3 or 42-FRM4 or assessment test						
Duratio	Duration Module level Other prerequisites					
1 seme	ster	undergraduate				
Conten	ts					
and thu	us enat	amiliarises students wi bles them to act approp cal system, and the ecc	riately in the target lan	guage. It discusses		
Intende	ed lear	ning outcomes				
in a var dents a workpla Operati	Students develop highly advanced language skills and a thorough familiarity with the culture and society of countries where the target language is spoken. They are thus able to communicate, both verbally and in writing, in a variety of situations, taking into account aspects related to the culture and society of said countries. Students are able to effectively and flexibly use the target language, both during study abroad periods and in the workplace. This module builds on level "B2 Vantage" and aims to enable students to reach level "C1 Effective Operational Proficiency" of the Common European Framework of Reference for Languages.					
		sessment (type, scope, lang				an an whathar
		le for bonus)	uage — II other than German,	examination onered — ii no	it every semester, mornati	on on whether
hension nutes) compre tes tota weighte	n, liste and wr ehensic al) as w ed 1:1;	en multi-component ex ning comprehension, w itten multi-component on, listening comprehen rell as 2 to 4 written ass options will be selected issessment: French	vriting, communication examination (approx. 6 nsion, writing) or option essments (approx. 10	skills) or option 2: o o to 90 minutes tota 1 3: 2 to 4 oral asses to 15 pages total), all	ral assessment (app al) with 3 component sments (approx. 30 l components/asses	orox. 10 mi- ts (reading to 60 minu- sments each
Allocat	ion of <sub>l</sub>	places				
Numbe	r of pla	ices: 5-25. Places will b	e allocated by lot.			
Additio	onal inf	ormation				
 Worklo	ad					
Teachi	ng cvcl	e				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
	<u></u>					
Module	annea	ars in				
Bachele Bachele Bachele Bachele Bachele Bachele	or' deg or' deg or' deg or' deg or' deg or' deg	ree (1 major) Chemistry ree (1 major) Business ree (1 major) Business ree (1 major) Economat ree (1 major) Economat ree (1 major) Business r Nanostructure Technology	Management and Econ Management and Econ hematics (2009) hematics (2008) Information Systems (2	omics (2010)	am. reg. da-	page 198 / 268
(2010)			_	r (120 ECTS) Nanostrukturtec	-	Page 190 / 200

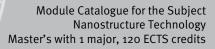
Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) Magister Theologiae Catholic Theology (2009) No final examination Special study offering (2010)

Module title					Abbreviation
Advanc	ed Frer	ich Final Exam			42-FRO-PR-072-m01
Module	coord	inator		Module offered by	
head of	Langu	age Centre (ZFS)		Language Centre (ZfS)	
ECTS Method of grading Only after succ. co			Only after succ. com	pl. of module(s)	
2 numerical grade					
Duratio	n	Module level	Other prerequisites		
1 semester undergraduate Registration for assessment: as specified.					d.
Conten	ts				
Final ex	am in t	he upper level of the targ	get language.		
Intende	d learr	ning outcomes			
Operati	onal Pr		n European Framewo	rk of Reference for L	equivalent to level "C1 Effective anguages. Students who passed en accredited.
Courses	<b>5</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
no cour	ses as	signed			
		e <b>essment</b> (type, scope, langua <sub>)</sub> le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
reading success Langua	; and lis sfully co ge of a		writing and oral comr at be considered succ	nunication skills; on	skills in the following four areas: Ily if all components have been
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachir	ig cycl	9			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	rs in			
Bachelo Bachelo Bachelo Bachelo Bachelo Master' Master'	Module appears in Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) Business Management and Economics (2009) Bachelor' degree (1 major) Business Management and Economics (2010) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Business Information Systems (2009) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009)				
Magiste	er Theo	logiae Catholic Theology	(2009)		

Module	e title			·	Abbreviation		
French	for Bus	iness 1 (Advanced Lev	el)		42-FRO-W1-072-mo	1	
<b>A4</b> - J. J.							
Module				Module offered by			
_		age Centre (ZFS)		Language Centre (Z	.rs)		
ECTS	<u> </u>	od of grading		nly after succ. compl. of module(s)			
4		rical grade		3 or 42-FRM4 or asse	essment test		
Duratio	on	Module level	Other prerequisites				
1 seme	ster	undergraduate					
Conten	ts						
			dvanced communicatio th written and oral form			l allow them	
Intende	ed learı	ning outcomes					
guage. nicate a ness ar stage, f	They d about s nd ecor they wi	evelop advanced busi elected topics in corre nomics terminology an Il have developed busi	economics-specific con ness- and economics-s sponding situations, us d are able to communic ness- and economics-s of the Common Europea	pecific language skil sing language flexib ate effectively withi pecific language ski	ls that will allow the ly. Students are prof n the discipline. At the lls that are equivale	m to commu- icient in busi- he end of the nt to level "C1	
		· · · ·	rs, language — if other than Ge				
			ontact hours) and cours		e)		
module is	s creditab	le for bonus)	guage — if other than German,				
compre tes tota weighte Langua	ehensio al) as w ed 1:1; ige of a	n, listening comprehe ell as 2 to 4 written as	examination (approx. 6 nsion, writing) or option sessments (approx. 10 d and examination date nter semester	n 3: 2 to 4 oral asses to 15 pages total), al	sments (approx. 30 l components/asses	to 60 minu- ssments each	
Allocat	ion of p	olaces					
Numbe	r of pla	ces: 5-25. Places will b	e allocated by lot.				
Additio	nal inf	ormation					
 Worklo	ad						
Teachi	ng cycl	9					
 Referre	d to in	LPO I (examination regulat	ions for teaching-degree progra	immes)			
Module	e appea	irs in					
Bachel Bachel Bachel Bachel Bachel	or' deg or' deg or' deg or' deg or' deg	ree (1 major) Chemistr ree (1 major) Business ree (1 major) Business ree (1 major) Economa ree (1 major) Economa	Management and Econ Management and Econ thematics (2009) thematics (2008)	omics (2010)			
		ree (1 major) Business	Information Systems (2		am reg da-	nage 201 / 269	
waster's w	itti i majoi	wanostructure rechnology	-	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturted	-	page 201 / 268	

Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) No final examination Special study offering (2010)

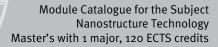
French for Business 2 (Advanced Level)       42-FR0-W2-072-m01         Module coordinator       Module offered by         head of Language Centre (ZFS)       Language Centre (ZfS)         ETTS       Method of grading       Only after succ. compl. of module(s)         A       numerical grade       42-FRM3 or 42-FRM3 or 42-FRM4 or assessment test         Duration       Module level       Other prerequisites         1 semester       undergraduate          Contents       This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriately, in both written and oral form, at university and in business settings.         Intended learning outcomes       Students gain sound business- and economics-specific communication skills (written and oral) in the target language. They develop advanced business- and economics-specific tanguage skills that are equivalent to loreer TC         Effective Operational Proficiency' of the Common European Framework of Reference for Languages.       Courses type, number diveloped business- and economics-specific language skills that are equivalent to level TC         On information on SWS (weekly contact hours) and course language available)       Method of assessment (type, sope, Language - If other than German)         Ou on information on SWS (weekly contact hours) and course language available)       Method assessment (type, sope, Language - If other than German)         On on information on SWS (weekly contact hours) and course lang	Module tit	le			Abbreviation	
head of Language Centre (ZFS)       Language Centre (ZFS)         ECTS       Method of grading       Only after succ. compl. of module(s)         4       numerical grade       42-FRM3 or 42-FRM3 or 42-FRM4 or assessment test         Duration       Module level       Other prerequisites         isemester       undergraduate          Contents           This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriated business- and economics-specific communication skills (written and oral) in the target language. They develop advanced business- and economics-specific anguage skills that will allow them to communicate appropriated business- and economics-specific anguage skills that will allow them to communicate about selected topics in corresponding situations, using language flexibly. Students are proficient in business eads economics-specific anguage skills that will allow them to communicate about selected business and economics-specific anguage skills that will allow them to communicate about selected topics in corresponding situations, using language flexibly. Students are equivalent to level 'C         Ourses (type, number of weekly contact hours, language – if other than Geman)       O         U in information on SWS (weekly contact hours) and course language available)         Method of assessment (type, scope, language – if other than Geman) canination offerd – if not every senester, information on whether madule is codinable for banus)         Option s: will be seleted and anexamination (approx. 30 to 60 minutes total)	French for	Business 2 (Advanced Lev	el)		42-FRO-W2-072-mc	)1
head of Language Centre (ZFS)       Language Centre (ZFS)         ECTS       Method of grading       Only after succ. compl. of module(s)         4       numerical grade       42-FRM3 or 42-FRM3 or 42-FRM4 or assessment test         Duration       Module level       Other prerequisites         1 semester       undergraduate          Contents           This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriately, in both written and oral form, at university and in business settings.         Intended learning outcomes          Students gain sound business- and economics-specific communication skills (written and oral) in the target language. They develop advanced business and economics-specific language skills that all allow them to communicate about selected topics in corresponding situations, using language flexibly. Students are proficient housiness and economics-specific language skills that are equivalent to level 'C         Courses (type, number of weekly contact hours, language – if other than Geman)       O         Q (n information on SWS (weekly contact hours, language – if other than Geman), examination offered – if not every senseter, information on whether module is creditable for bona)         Option 1: written multi-component examination (approx. 9 on inutes total) with 4 components (reading comprehension, writing, communication skills) or option 1: oral assessment (approx. 30 to 6 on inutes total) as well as 2 to 4 written assessment (approx. 40 to 11 seges total),	Module co	ordinator		Module offered by	<u> </u>	
ECTS         Method of grading         Only after succ. compl. of module(s)           4         numerical grade         42-FRM3 or 42-FRM3 or 42-FRM4 or assessment test           Duration         Module level         Other prerequisites           isemester         undergraduate            Contents	head of La	inguage Centre (7FS)			'fS)	
4       numerical grade       42-FRM2 or 42-FRM3 or 42-FRM4 or assessment test         Duration       Module level       Other prerequisites         1 semester       undergraduate          Contents           This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriately, in both written and oral form, at university and in business settings.         Intended learning outcomes			Only after succ. con			
Duration         Module level         Other prerequisites           1 semester         undergraduate            Contents            This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriately, in both written and oral form, at university and in business settings.           Intended learning outcomes            Students gain sound business- and economics-specific communication skills (written and oral) in the target language. They develop advanced business- and economics-specific language skills that at re equivalent to level 'C           stage, they develop advanced business- and economics-specific language skills that are equivalent to level 'C           Curses (type, number of weekly contact hours, language – if other than German)				•	scmont tost	
1 semester       undergraduate          Contents          This module equips students with advanced communication skills in the target language. These will allow them to communicate appropriately, in both written and oral form, at university and in business settings.         Intended learning outcomes       Students gain sound business- and economics-specific communication skills (written and oral) in the target language. They develop advanced business- and economics-specific language fixibly. Students are proficient in business and economics terminology and are able to communicate effectively within the discipline. At the end of the stage, they will have developed business- and econome European Framework of Reference for Languages.         Courses lyne, number of weekly contact hours, language – if other than German)       0 (no information on SWS (weekly contact hours) and course language available)         Method of assessment (type, scope, language – if other than German)       0 (no information on SWS (weekly contact hours) and course language total) with 4 components (reading comprehension, writing, communication skills) or option 2: oral assessment (approx. to minutes) and written multi-component examination (approx. 90 minutes total) with 3 components (reading comprehension, writing, communication skills) for uponents (approx. 30 to 60 minutes total) will a save to a written assessments (approx. to 10 to pages total), all components/assessments eact weighted 1:: options will be selected and examination dates be fixed at the beginning of the course Language of assessment is approx. To to 15 pages total), all components/assessments eact weighted 1:: options will be selected and examination dates be fixed at the beginning of the course Language of assessment. French <td></td> <td></td> <td>1 · · · ·</td> <td>· · ·</td> <td>ssment test</td> <td></td>			1 · · · ·	· · ·	ssment test	
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Workload            Teaching cycle            Referred to in LPO I (examination regulations for teaching-degree programmes)            Module appears in         Bachelor' degree (1 major) Chemistry (2009)         Bachelor' degree (1 major) Business Management and Economics (2009)         Bachelor' degree (1 major) Business Management and Economics (2010)         Bachelor' degree (1 major) Economathematics (2009)         Bachelor' degree (1 major) Economathematics (2009)         Bachelor' degree (1 major) Business Information Systems (2009)         Master's with 1 major Nanostructure Technology         JMU Würzburg • generated 26-Aug-2024 • exam. reg. da-         page 203 / 268	Number of	f places: 5-25. Places will b	e allocated by lot.			
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Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) No final examination Special study offering (2010)

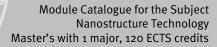
Spanis	e title				Abbreviation	
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Module	e coord	inator		Module offered by	<u> </u>	
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4 Duratio		Module level	Other prerequisites			
1 semes		undergraduate				
······································		undergraduate	1			
Conten						
		quips students with advite appropriately, in bot				
Intende	ed lear	ning outcomes				
in corre able to ties-spe Europe	espond comm ecific la an Frar	ed humanities-specific l ing situations, using lar unicate effectively withi anguage skills that are e nework of Reference for	nguage flexibly. Studen n the discipline. At the equivalent to level "C1 Languages.	nts are proficient in l e end of the stage, th Effective Operatio	humanities terminolo ney will have develop	ogy and are bed humani-
Courses	<b>S</b> (type, r	number of weekly contact hours	, language — if other than Gei	rman)		
Ü (no ir	nforma	tion on SWS (weekly co	ntact hours) and cours	e language availabl	e)	
		<b>Sessment</b> (type, scope, langu le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
compre tes tota	ehensio al) as w	itten multi-component e on, listening comprehen rell as 2 to 4 written ass	sion, writing) or option	-		ts (reading
Langua	ige of a	options will be selected ssessment: Spanish	and examination date	to 15 pages total), al	l components/asses	sments each
Langua Assess	ge of a ment o	options will be selected ssessment: Spanish ffered: once a year, win	and examination date	to 15 pages total), al	l components/asses	sments each
Langua Assessi Allocati	ge of a ment o <b>ion of j</b>	options will be selected ssessment: Spanish ffered: once a year, win <b>blaces</b>	and examination date	to 15 pages total), al	l components/asses	sments each
Langua Assessi Allocat Numbe	ge of a ment o <b>ion of j</b> r of pla	options will be selected ssessment: Spanish ffered: once a year, win <b>blaces</b> ices: 5-25. Places will be	and examination date	to 15 pages total), al	l components/asses	sments each
Langua Assessi Allocat Numbe	ge of a ment o <b>ion of j</b> r of pla	options will be selected ssessment: Spanish ffered: once a year, win <b>blaces</b>	and examination date	to 15 pages total), al	l components/asses	sments each
Langua Assessi Allocati Numbe Additio	ige of a ment o ion of j r of pla nal inf	options will be selected ssessment: Spanish ffered: once a year, win <b>blaces</b> ices: 5-25. Places will be	and examination date	to 15 pages total), al	l components/asses	sments each
Langua Assessi Allocat Numbe	ige of a ment o ion of j r of pla nal inf	options will be selected ssessment: Spanish ffered: once a year, win <b>blaces</b> ices: 5-25. Places will be	and examination date	to 15 pages total), al	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo 	ge of a ment o ion of j r of pla nal inf	options will be selected ssessment: Spanish ffered: once a year, win olaces icces: 5-25. Places will be ormation	and examination date	to 15 pages total), al	l components/asses	sments each
Langua Assessi Allocati Numbe Additio	ge of a ment o ion of j r of pla nal inf	options will be selected ssessment: Spanish ffered: once a year, win olaces icces: 5-25. Places will be ormation	and examination date	to 15 pages total), al	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo  Teachir 	ge of a ment o ion of j r of pla nal inf ad	options will be selected ssessment: Spanish ffered: once a year, win olaces aces: 5-25. Places will be ormation	and examination date	to 15 pages total), all es be fixed at the be	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo  Teachir 	ge of a ment o ion of j r of pla nal inf ad	options will be selected ssessment: Spanish ffered: once a year, win olaces icces: 5-25. Places will be ormation	and examination date	to 15 pages total), all es be fixed at the be	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo  Teachir  Referre 	ge of a ment o ion of p r of pla nal inf ad ng cycl	options will be selected ssessment: Spanish ffered: once a year, win olaces aces: 5-25. Places will be ormation e LPOI (examination regulation	and examination date	to 15 pages total), all es be fixed at the be	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo  Teachir  Referre  Module	ge of a ment o ion of j r of pla nal inf ad ng cycl ed to in	options will be selected ssessment: Spanish ffered: once a year, win places icces: 5-25. Places will be ormation e LPOI (examination regulation ars in	and examination date ter semester e allocated by lot.	to 15 pages total), all es be fixed at the be	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo  Teachir  Referre Bachelo	ge of a ment o ion of j r of pla onal inf ad ed to in e appea or' deg	options will be selected ssessment: Spanish ffered: once a year, win olaces acces: 5-25. Places will be ormation e LPO I (examination regulation ars in ree (1 major) Economation	and examination date ter semester e allocated by lot.	to 15 pages total), all es be fixed at the be	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo  Teachir  Referre Bachelo Bachelo	ge of a ment o ion of j r of pla onal inf ad ed to in e appea or' deg or' deg	options will be selected ssessment: Spanish ffered: once a year, win olaces aces: 5-25. Places will be ormation e LPO I (examination regulation ars in ree (1 major) Economation ree (1 major) Economation	and examination date ter semester e allocated by lot. ns for teaching-degree progra	to 15 pages total), all es be fixed at the be	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo  Teachir  Referre  Bachelo Bachelo Master	ge of a ment o ion of pla nal inf ad ad ed to in e appea or' deg or' deg 's degr	options will be selected ssessment: Spanish ffered: once a year, win olaces acces: 5-25. Places will be ormation e LPO I (examination regulation ars in ree (1 major) Economation	and examination date ter semester e allocated by lot. ns for teaching-degree progra nematics (2009) nematics (2008) ure Technology (2011)	to 15 pages total), all es be fixed at the be	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo  Teachir  Referre  Bachelo Bachelo Master Master	ge of a ment o ion of j r of pla nal inf ad ad ad ad ad ad ad ad ad ad ad ad ad	options will be selected ssessment: Spanish ffered: once a year, win places acces: 5-25. Places will be ormation e LPOI (examination regulation ars in ree (1 major) Economath ree (1 major) Economath ee (1 major) Nanostruct	and examination date ter semester e allocated by lot. e allocated by lot. ns for teaching-degree progra nematics (2009) nematics (2008) ure Technology (2011) ure Technology (2010)	to 15 pages total), all es be fixed at the be	l components/asses	sments each
Langua Assessi Allocati Numbe Additio  Worklo  Teachir  Referre Bachelo Bachelo Master Master Master	ge of a ment o ion of j r of pla onal inf ad ad ad ad ad ad ad ad ad ad ad ad ad	options will be selected ssessment: Spanish ffered: once a year, win places aces: 5-25. Places will be ormation e LPOI (examination regulation ars in ree (1 major) Economation ree (1 major) Nanostruction ee (1 major) Nanostruction ee (1 major) Nanostruction ee (1 major) Nanostruction ee (1 major) Nanostruction	and examination date ter semester e allocated by lot. e allocated by lot. ns for teaching-degree progra nematics (2009) nematics (2008) ure Technology (2011) ure Technology (2010) sics - Nanostructuring	to 15 pages total), all es be fixed at the be	l components/asses	sments each



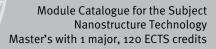


Spanis	e title				Abbreviation	
	h for th	e Humanities 2 (Advan	ced Level)		42-SPO-GW2-072-n	101
Module	e coord	inator		Module offered by		
head of	f Langu	age Centre (ZFS)		Language Centre (Z	fS)	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	nume	rical grade	42-SPM2 or 42-SPM	3 or 42-SPM4 or ass	essment test	
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts		-			
		quips students with ad ite appropriately, in bo				
Intende	ed lear	ning outcomes				
in corre able to ties-spe Europe	espond comm ecific la an Frar	ed humanities-specific ing situations, using la unicate effectively with anguage skills that are nework of Reference fo	nguage flexibly. Studer in the discipline. At the equivalent to level "C1 r Languages.	nts are proficient in l e end of the stage, th Effective Operatio	numanities terminolo ley will have develop	ogy and are bed humani-
		tion on SWS (weekly co			a)	
module is option hension nutes) a compre tes tota weighte Langua	creditab 1: writt n, liste and wr chensic al) as w ed 1:1; ge of a	esssment (type, scope, lang le for bonus) en multi-component ex ning comprehension, w itten multi-component on, listening comprehen ell as 2 to 4 written ass options will be selected ssessment: Spanish	amination (approx. 90 riting, communication examination (approx. 6 nsion, writing) or option essments (approx. 10	minutes total) with skills) or option 2: o 50 to 90 minutes tots n 3: 2 to 4 oral asses to 15 pages total), al	4 components (readi ral assessment (app al) with 3 component sments (approx. 30 l components/asses	ng compre- rox. 10 mi- ts (reading to 60 minu-
Assess	ment o	ffered: once a year, su	nmer semester		ginning of the course	
Assess Allocat		ffered: once a year, sur	nmer semester		ginning of the course	
Allocat	ion of <sub>l</sub>	ffered: once a year, sur				
<b>Allocat</b> Numbe	<b>ion of j</b> r of pla	ffered: once a year, sur places				
Allocat Numbe Additio  Worklo 	ion of J r of pla nal inf ad	ffered: once a year, sur olaces ices: 5-25. Places will b ormation				
Allocat Numbe Additio	ion of J r of pla nal inf ad	ffered: once a year, sur olaces ices: 5-25. Places will b ormation				
Allocat Numbe Additio  Worklo  Teachir	ion of j r of pla nal inf ad ng cycl	ffered: once a year, sur places ices: 5-25. Places will b ormation e	e allocated by lot.			
Allocat Numbe Additio  Worklo  Teachir	ion of j r of pla nal inf ad ng cycl	ffered: once a year, sur olaces ices: 5-25. Places will b ormation	e allocated by lot.			
Allocat Numbe Additio  Worklo  Teachin  Referre	ion of j r of pla nal inf ad ng cycl	ffered: once a year, sur places ices: 5-25. Places will b ormation e LPOI (examination regulati	e allocated by lot.			
Allocat Numbe Additio  Worklo  Teachir  Referre  Module	ion of pla r of pla nal inf ad ng cycl ed to in	ffered: once a year, sur places ices: 5-25. Places will b ormation e LPO I (examination regulati	e allocated by lot.			
Allocat Numbe Additio  Worklo  Teachin  Referre Bachelo Bachelo Master Master Master	ion of pla r of pla nal inf ad ad ad ad ad ad ad ad ad ad ad ad ad	ffered: once a year, sur places ices: 5-25. Places will b ormation e LPOI (examination regulati	e allocated by lot.	ummes)		





Module	e title				Abbreviation	
Intercu	ltural C	Competence (Spanish, A	Advanced Level)		42-SPO-IK-072-mo1	
Module	e coord	inator		Module offered by	<u> </u>	
head o	f Langu	age Centre (ZFS)		Language Centre (Z	fS)	
ECTS	1	od of grading	Only after succ. con	•	- /	
3	1	rical grade		3 or 42-SPM4 or ass	essment test	
<u>)</u> Duratio		Module level	Other prerequisites			
1 seme		undergraduate				
Conten						
cultura	l situat	quips students with kn ions. It familiarises the n to adequately interpr	m with criteria and opt	ions for action and e	quips them with kno	
Intend	ed lear	ning outcomes				
flexibly level "E	v use th 32 Va	ng, in a globalised worl e target language, both ntage" and aims to ena pean Framework of Ref	during study abroad p ble students to reach	periods and in the wo	orkplace. This modul	e builds on
Course	<b>S</b> (type, r	umber of weekly contact hours	s, language — if other than Ge	rman)		
Ü (no iı	nforma	tion on SWS (weekly co	ntact hours) and cours	e language available	e)	
Metho	d of ass	<b>essment</b> (type, scope, lang	uage — if other than German,	examination offered — if no	ot every semester, informat	on on whether
module is	s creditab	le for bonus)				
nutes) compre tes tota weight	and wr ehensic al) as w ed 1:1;	ning comprehension, w itten multi-component on, listening compreher ell as 2 to 4 written ass options will be selected ssessment: Spanish	examination (approx. 6 nsion, writing) or option essments (approx. 10	50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	al) with 3 components sments (approx. 30 l components/asses	ts (reading to 60 minu- sments each
Allocat						
	-	ces: 5-25. Places will b	e allocated by lot			
		ormation				
Additio	nat ini					
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
Module	e appea	nrs in				
Bachel	or' deg	ree (1 major) Chemistry	(2009)			
Bachel	or' deg	ree (1 major) Business	Management and Econ	omics (2009)		
	-	ree (1 major) Business	-	omics (2010)		
	-	ree (1 major) Economat				
	-	ree (1 major) Economat		)		
	-	ree (1 major) Business	•	:009)		
N/ +			uro lochnoloci (oc)			
	-	ee (1 major) Nanostruct	ure Technology (2011)	generated 26-Aug-2024 • ex	am reg da-	page 209 / 268



Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) Magister Theologiae Catholic Theology (2009) No final examination Special study offering (2010)

Module	title				Abbreviation	
Cultura	l Studi	es (Spanish, Advanced	Level)		42-SPO-LK-072-mo	1
Module	e coord	inator		Module offered by		
head of	f Langu	lage Centre (ZFS)		Language Centre (Z	fS)	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
3	nume	rical grade	42-SPM2 or 42-SPM	3 or 42-SPM4 or ass	essment test	
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
and thu	ıs enat	amiliarises students wi bles them to act approp cal system, and the ecc	riately in the target lan	guage. It discusses		
Intende	ed lear	ning outcomes				
in a var dents a workpla Operati	iety of ire able ace. Th ional P	re the target language situations, taking into to effectively and flexi is module builds on lev roficiency" of the Comm	account aspects relate bly use the target lang rel "B2 Vantage" and non European Framewo	d to the culture and s uage, both during st aims to enable stud ork of Reference for L	society of said count udy abroad periods ents to reach level "	ries. Stu-
		tion on SWS (weekly co			a)	
Methoo module is	<b>d of ass</b> creditab	<b>Sessment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	
hension nutes) a compre tes tota weighte	n, liste and wr hensic Il) as w ed 1:1;	en multi-component ex ning comprehension, w itten multi-component on, listening compreher rell as 2 to 4 written ass options will be selected ssessment: Spanish	riting, communication examination (approx. 6 nsion, writing) or option essments (approx. 10	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	ral assessment (app al) with 3 component sments (approx. 30 l components/asses	orox. 10 mi- ts (reading to 60 minu- sments each
Allocat	ion of <sub>l</sub>	olaces				
Numbe	r of pla	ices: 5-25. Places will b	e allocated by lot.			
Additio	nal inf	ormation				
 Worklo	ad					
Teachir	ng cvcl	e				
Referre	d to in	LPO I (examination regulation		ammec)		
Module	annea	ars in				
Bachelo Bachelo Bachelo Bachelo Bachelo Bachelo	or' deg or' deg or' deg or' deg or' deg or' deg	ree (1 major) Chemistry ree (1 major) Business ree (1 major) Business ree (1 major) Economat ree (1 major) Economat ree (1 major) Business	Management and Econ Management and Econ hematics (2009) hematics (2008) Information Systems (2	omics (2010) 2009)		
Master's wi (2010)	th 1 majo	r Nanostructure Technology	-	generated 26-Aug-2024 • ex er (120 ECTS) Nanostrukturtec	-	page 211 / 268

Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) Magister Theologiae Catholic Theology (2009) No final examination Special study offering (2010)

Module	title				Abbreviation
Advanc	ed Spa	nish Final Exam			42-SPO-PR-072-m01
Module	coord	inator		Module offered by	
head of	f Langu	age Centre (ZFS)		Language Centre (Z	fS)
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
2	numei	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate	Registration for asse	essment: as specifie	d.
Conten	ts			·	
Final ex	am in t	the upper level of the targ	get language.		
Intende	ed learr	ning outcomes			
Operati the exa	onal Pr m may	roficiency" of the Commo obtain a UNIcert(R) Leve	n European Framewo I III certificate once th	rk of Reference for L he university has bee	equivalent to level "C1 Effective anguages. Students who passed en accredited.
Courses	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
no cour	ses as	signed			
		e <b>ssment</b> (type, scope, langua) le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
reading success Langua	g and lis sfully co ge of a		writing and oral comr at be considered succ	nunication skills; on	skills in the following four areas: Iy if all components have been
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cyclo	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	irs in			
Bachelo	or' degi	ree (1 major) Chemistry (2	2009)		
	-	ree (1 major) Business Ma	-	-	
	-	ree (1 major) Business Ma	-	omics (2010)	
	-	ree (1 major) Economathe	-		
	-	ree (1 major) Economathe		)	
	-	ree (1 major) Business Inf ee (1 major) Nanostructur	-	009)	
	-	ee (1 major) FOKUS Physic		Technology (2010)	
	-	gree (1 major, 1 minor) Pe		(2010)	
		logiae Catholic Theology			
			•		

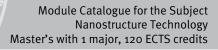
<b>C</b>	e title				Abbreviation	
Spanis	h for B	usiness 1 (Advanced Lev	vel)		42-SPO-W1-072-mc	01
Module	e coord	inator		Module offered by	<u>I</u>	
head o	f Langu	age Centre (ZFS)		Language Centre (Z	2fS)	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
4	nume	rical grade	42-SPM2 or 42-SPM	3 or 42-SPM4 or ass	essment test	
Duratio		Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten						
This mo	odule e	quips students with adv te appropriately, in bot				l allow them
		ning outcomes		i, at aniversity and i	in submess settings.	
guage. nicate a ness ar stage, f	They d about s nd ecor they wi	sound business- and evelop advanced busine evelop advanced busine elected topics in corres nomics terminology and Il have developed busin erational Proficiency" of	ess- and economics-sp ponding situations, us are able to communic tess- and economics-s	pecific language skil sing language flexibl cate effectively within specific language ski	ls that will allow the ly. Students are prof n the discipline. At the lls that are equivale	m to commu icient in busi he end of the nt to level "C
		number of weekly contact hours,	·			
		tion on SWS (weekly cor			a)	
		<b>sessment</b> (type, scope, langu ile for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
hensio	n, liste	en multi-component exa ning comprehension, wi	riting, communication	skills) or option 2: 0	ral assessment (app	prox. 10 mi-
hensio nutes) compre tes tota weighte Langua	n, liste and wr ehensio al) as w ed 1:1; age of a		riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	ral assessment (app al) with 3 componen sments (approx. 30 l components/asses	prox. 10 mi- ts (reading to 60 minu- ssments each
hensio nutes) compre tes tota weighte Langua	n, liste and wr chensic al) as w ed 1:1; age of a ment o	ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asse options will be selected ssessment: Spanish ffered: once a year, win	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	ral assessment (app al) with 3 componen sments (approx. 30 l components/asses	prox. 10 mi- ts (reading to 60 minu- ssments each
hensio nutes) compre tes tota weighte Langua Assess Allocat	n, liste and wr chensic al) as w ed 1:1; age of a ment o <b>ion of j</b>	ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asse options will be selected ssessment: Spanish ffered: once a year, win	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	ral assessment (app al) with 3 componen sments (approx. 30 l components/asses	prox. 10 mi- ts (reading to 60 minu- ssments each
hensio nutes) compre tes tota weighte Langua Assess Allocat Numbe	n, liste and wr ehensic al) as w ed 1:1; age of a ment o <b>ion of</b> pla	ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asse options will be selected ssessment: Spanish ffered: once a year, wint <b>blaces</b>	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	ral assessment (app al) with 3 componen sments (approx. 30 l components/asses	prox. 10 mi- ts (reading to 60 minu- ssments each
hensio nutes) compre tes tota weighte Langua Assess Allocat Numbe	n, liste and wr ehensic al) as w ed 1:1; age of a ment o <b>ion of</b> pla	ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asse options will be selected ssessment: Spanish ffered: once a year, wint <b>blaces</b> acces: 5-25. Places will be	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	ral assessment (app al) with 3 componen sments (approx. 30 l components/asses	prox. 10 mi- ts (reading to 60 minu- ssments each
hensio nutes) compre tes tota weighte Langua Assess Allocat Numbe	n, liste and wr ehensic al) as w ed 1:1; age of a ment o ion of pla pnal inf	ning comprehension, wi itten multi-component e on, listening comprehen rell as 2 to 4 written asse options will be selected ssessment: Spanish ffered: once a year, wint <b>blaces</b> acces: 5-25. Places will be	riting, communication examination (approx. 6 sion, writing) or option essments (approx. 10 and examination date ter semester	skills) or option 2: o 50 to 90 minutes tota n 3: 2 to 4 oral asses to 15 pages total), al	ral assessment (app al) with 3 componen sments (approx. 30 l components/asses	prox. 10 mi- ts (reading to 60 minu- ssments each
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Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) No final examination Special study offering (2010)

	e title				Abbreviation	
Spanis	h for B	usiness 2 (Advanced Le	vel)		42-SPO-W2-072-m	01
Module	e coord	inator		Module offered by		
head o	fLangu	lage Centre (ZFS)		Language Centre (Z	(fS)	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
4	1	rical grade		3 or 42-SPM4 or ass	essment test	
Duratio		Module level	Other prerequisites			
1 seme		undergraduate				
Conten		undergraduate				
		quips students with adv		n skills in the target	language. These will	allow them
		ite appropriately, in bot				
		ning outcomes				
nicate ness ai stage,	about s nd ecor they wi	evelop advanced busing selected topics in corres nomics terminology and Il have developed busing erational Proficiency" o	ponding situations, us are able to communic less- and economics-s	sing language flexibl ate effectively within pecific language ski	y. Students are profi n the discipline. At th lls that are equivaler	icient in busi ne end of the nt to level "C
		number of weekly contact hours	·			
	-	tion on SWS (weekly con			a)	
		· · · · · · · · · · · · · · · · · · ·				ion on whathar
module is		sessment (type, scope, langu	lage — If other than German,	examination offered — if no	ot every semester, informat	ion on whether
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Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2009) No final examination Special study offering (2010)

Module	title				Abbreviation	
Operations Research					10-M-ORS-072-m01	
Module coordinator				Module offered by	<u> </u>	
		es Mathematik (Mathe	matics)	Institute of Mathem	natics	
ECTS		od of grading	Only after succ. com		latics	
5		rical grade		.p.u. c		
Duratio	L	Module level	Other prerequisites			
1 semester undergraduate		sessment. The lecture at the beginning of t sidered a declaration 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		L			
Linearp	orograr	nming, duality theory,	transport problems, int	egral linear program	ming, graph theoreti	c problems.
		ning outcomes	· · ·			
for solv probler	ing ma ns, bot	ny practical problems h theoretically and nu	undamental methods in especially in economics merically. s, language — if other than Ger	s. He/She is able to		
			ly contact hours) and co		able)	
Method	d of ass		guage — if other than German, e			on on whether
by an o 2, appr	ral exa ox. 30	mination of one candio minutes)	utes); if announced by date each (approx. 20 m nglish if agreed upon w	ninutes) or an oral ex		
Allocat						
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	e				
	Referred to in LPO I (examination regulations for teaching-degree programmes)					
		hematik Angewandte I	Mathematik			
Module						
Bachelo Bachelo Bachelo	Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009)					
Master's wi (2010)	th 1 major	Nanostructure Technology		generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec		page 218 / 268



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) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

Module	title				Abbreviation	
	Numerical Mathematics 1 10-M-NM1-082-m01					
				Madula affared by		
Module			- + : )	Module offered by		
_		es Mathematik (Mathema		Institute of Mathem	latics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	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 fo			ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-	
Conten	ts		admission to assess			
Solutio ons, int	n of sy: terpola	stems of linear equations tion with polynomials, sp				s of equati-
		ning outcomes				
		acquainted with the fun oblems and knows abou			erical mathematics,	applies them
Course	<b>S</b> (type, n	umber of weekly contact hours,	language — if other than Ger	man)		
V + Ü (r	no infor	mation on SWS (weekly	contact hours) and co	urse language avail	able)	
		<b>essment</b> (type, scope, langua le for bonus)	age — if other than German, e	examination offered — if no	t every semester, informat	ion on whether
by an o 2, appr	oral exa	nation (approx. 90 minut mination of one candida minutes) ssessment: German, Eng	te each (approx. 20 m	iinutes) or an oral ex		
Allocat	ion of p	olaces				
			,			
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	<b>A</b>				
	-5 cycl	-				
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
§ 73 (1)	5. Mat	hematik Angewandte Ma	athematik			
Module	e appea	ars in				
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2009) Bachelor' degree (1 major) Physics (2012)						
		Nanostructure Technology	JMU Würzburg •	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 220 / 268

# UNIVERSITÄT WÜRZBURG

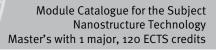
Bachelor' degree (1 major) Physics (2008) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (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	ical Ma	thematics 2			10-M-NM2-082-mo	1
Module	e coord	inator		Module offered by		
Dean o	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
5	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			ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-	
Conten	ts		admission to assess			
Solutio	n meth	ods and applications for al equations, boundary v		s, linear programmin	ıg, initial value probl	ems for ordi-
Intend	ed learı	ning outcomes				
about t and en	heir ad gineeri	able to draw a distinction vantages and limitations ng sciences and econom umber of weekly contact hours,	s concerning the poss ics.	ibilities of application		
		mation on SWS (weekly			able)	
Metho	d of ass	sessment (type, scope, languate le for bonus)				ion on whether
by an o 2, appr	oral exa ox. 30	nation (approx. 90 minut mination of one candida minutes) ssessment: German, Eng	te each (approx. 20 n	ninutes) or an oral ex		
Allocat	ion of p	olaces				
Additio	onal info	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
		hematik Angewandte Ma				
Module	-	-				
Bachel Bachel Bachel	or' deg or' deg or' deg	ree (1 major) Mathematic ree (1 major) Physics (20 ree (1 major) Physics (20 ree (1 major) Physics (20	10) 09)			
Master's w (2010)	ith 1 majoı	Nanostructure Technology	-	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 222 / 268

# UNIVERSITÄT WÜRZBURG

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)

Modul	e title				Abbreviation	
Advan	ced Ana	llysis			10-M-VAN-082-m01	
Modul	e coord	inator		Module offered by	1	
Dean o	of Studi	es Mathematik (Mathe	matics)	Institute of Mathem	natics	
ECTS		od of grading	Only after succ. con	pl. of module(s)		
8	1	rical grade				
Duratio		Module level	Other prerequisites			
1 semester undergraduate		sessment. The lecture at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment into	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			
Conter	nts	L	- <b>I</b>			
Lebesg	gue inte	gral in several variable ry Fourier theory in L^2	s, including theorems o , Gauss's theorem.	on convergence and	Fubini's theorem, L^p	-spaces
Intend	ed lear	ning outcomes				
			nced topics in analysis. uction of a complex ma			gral, he or
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Ger	rman)		
Ü + V (	no infoi	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, lang le for bonus)	guage — if other than German, o	examination offered — if no	ot every semester, informatior	n on whether
by an o 2, appr Langua	oral exa rox. 30 age of a	mination of one candio minutes) ssessment: German, E	utes); if announced by late each (approx. 20 n nglish if agreed upon w	ninutes) or an oral e		
Allocat	tion of <sub>l</sub>	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
			ons for teaching-degree progra	mmes)		
		hematik Analysis				
	e appea					
	-	ree (1 major) Mathema				
		ree (1 major) Economat				
	-	ree (1 major) Economat ree (1 major) Mathema				
	-		ional Mathematics (2009)	09)		
		r Nanostructure Technology		generated 26-Aug-2024 • ex	am. reg. da-	page 224 / 268
(2010)				r (120 ECTS) Nanostrukturteo		



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

Module title				Abbreviation	
Fundamentals of Commercial Law					02-N-P-H-082-m01
Module	coord	inator		Module offered by	
Dean of	fStudi	es Faculty of Law	_	Faculty of Law	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
4	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
		nts available but not tran	·		
Das Mo	dul ers	chließt den zentralen Be	reich des Handelsrec	hts.	
Intende	ed learı	ning outcomes			
Germar	n inten	ded learning outcomes av	vailable but not trans	lated yet.	
insbeso	ondere	mit den Vorschriften übe	r die Kaufleute, das H	landelsregister, die	chts erworben. Sie haben sich Handelsfirma, Prokura, Hand- d den Handelskauf beschäftigt.
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (no in	Iformat	ion on SWS (weekly cont	act hours) and cours	e language available	2)
		<b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
a) writte	en exai	nination (approx. 120 mi	nutes) or b) oral exan	nination (approx. 15	minutes)
Allocat	ion of p	olaces			
with 60 as follo will be	ECTS o ws: Stu given p	credits): no restrictions. S Idents applying after not	Students of other deg having successfully . The remaining place	ree programmes: 20 completed assessme	Privatrecht (Private Law) (minor places. Places will be allocated ent in in the last two semesters by lot. A waiting list will be main-
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	e appea	irs in			
	-	ee (1 major) Nanostructur	•, · ·		
	-	ee (1 major) Nanostructur gree (1 major, 1 minor) Pri		8)	
		gree (1 major, 1 minor) Pri			

Module title					Abbreviation	
Employ	/ment l	aw			02-N-P-A-082-m01	
Module	e coord	inator		Module offered by		
Dean o	Dean of Studies Faculty of Law			Faculty of Law		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
4	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester undergraduate						
Contents						

German contents available but not translated yet.

Die Veranstaltung verschafft den Studierenden einen Überblick über System und Struktur des Arbeitsrechts und geht dabei auf die wichtigsten Problembereiche ein.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden haben umfassende Kenntnisse auf dem Gebiet des Individualrechts erworben. Daneben haben sie sich mit bedeutenden Fragestellungen des Kollektivarbeitsrechts auseinandergesetzt.

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

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

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

a) written examination (approx. 120 minutes) or b) oral examination (approx. 15 minutes)

### Allocation of places

Degree programm law (degree "Erste Juristische Staatsprüfung") and Bachelor's Privatrecht (Private Law) (minor with 60 ECTS credits): no restrictions. Students of other degree programmes: 20 places. Places will be allocated as follows: Students applying after not having successfully completed assessment in in the last two semesters will be given preferential consideration. The remaining places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

Additional information

Workload

--

**Teaching cycle** 

--

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

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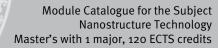
Module appears in

Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Bachelor's degree (1 major, 1 minor) Private Law (Minor, 2008) Bachelor's degree (1 major, 1 minor) Private Law (Minor, 2011)

Introduction to Companies Law     02-N-P-G-082-m01       Module coordinator     Module offered by				
Deap of Studios Faculty of Law				
Dean of Studies Faculty of Law Faculty of Law				
ECTS         Method of grading         Only after succ. compl. of module(s)				
2 numerical grade				
Duration Module level Other prerequisites				
1 semester undergraduate				
Contents				
German contents available but not translated yet.				
Gegenstand der Vorlesung sind Grundzüge des Rechts der Personengesellschaften und der GmbH.				
Intended learning outcomes				
German intended learning outcomes available but not translated yet.				
Die Studierenden haben wesentliche Kenntnisse über die Personengesellschaften, insbesondere die oHG un die GbR erlangt. Darüber hinaus haben sie Einblicke in das Recht der Kapitalgesellschaften erhalten.				
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)				
V (no information on SWS (weekly contact hours) and course language available)				
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whet module is creditable for bonus)				
a) written examination (approx. 120 minutes) or b) oral examination (approx. 15 minutes)				
Allocation of places				
Degree programm law (degree "Erste Juristische Staatsprüfung") and Bachelor's Privatrecht (Private Law) (mi with 60 ECTS credits): no restrictions. Students of other degree programmes: 20 places. Places will be alloca as follows: Students applying after not having successfully completed assessment in in the last two semester will be given preferential consideration. The remaining places will be allocated by lot. A waiting list will be m tained and places re-allocated as they become available.				
Additional information				
Workload				
Teaching cycle				
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)				
Module appears in				
Master's degree (1 major) Nanostructure Technology (2011)				
Master's degree (1 major) Nanostructure Technology (2010) Bachelor's degree (1 major, 1 minor) Private Law (Minor, 2008)				
Bachelor's degree (1 major, 1 minor) Private Law (Minor, 2008) Bachelor's degree (1 major, 1 minor) Private Law (Minor, 2011)				

Module title					Abbreviation	
Europe	ean Con	ipany Law			02-N-P-W04-112-m	01
Modul	e coord	inator		Module offered by	Module offered by	
Dean c	of Studi	es Faculty of Law		Faculty of Law		
ECTS Method of grading Only after succ. compl. of module(s)						
2	nume	rical grade				
Duratio	on	Module level	Other prerequisites	;		
1 seme	ester	undergraduate				
Conter	nts					
Germa	n conte	nts available but not t	ranslated yet.			
			se des Gemeinschaftsro chung durch Richtlinier			lassungsfrei-
Intend	ed lear	ning outcomes				
Germa	n inten	ded learning outcomes	available but not trans	slated yet.		
züge d	es Gese		etzten Jahren immer stä und können das deuts			
Course	<b>es</b> (type, r	number of weekly contact hou	rs, language — if other than Ge	rman)		
V (no i	nformat	ion on SWS (weekly co	ontact hours) and cours	e language available	e)	
			guage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
		le for bonus)		·····		
		ffered: once a year, wi	minutes) or b) oral exa nter semester	mination (approx. 15	minutes)	
	tion of <b>j</b>	· ·				
(first st nor wit set asi lication re be n lows: S tial cor	tate exa th 60 EC de for A ns, the nore tha Student nsidera	mination in law) and s TS credits): no restrict Master's students of Ec remaining places can b an 10 applications fron s applying after not ha	Rechtswissenschaften ( students of the Bachelo ions. Students of other onomics. Should the n be allocated to students in students of other sub ving successfully comp aces will be allocated b	r's degree programm degree programmes umber of places avai s of other subjects/d jects, the remaining pleted assessment in	ne Privatrecht (Privat 5: 20 places, 10 of w ilable exceed the nu egree programmes. 10 places will be all past years will be g	te Law) (mi- hich will be mber of app- Should the- ocated as fol- iven preferen
Additio	onal inf	ormation				
	_					
Worklo	oad					
Teachi	ing cycl	e				
Referre	ed to in	LPO I (examination regulat	ions for teaching-degree progra	ammes)		
	e appea					
Master	r's degr		ture Technology (2011) ture Technology (2010) 5 (2014)			
Master's w (2010)	vith 1 majo	r Nanostructure Technology	-	e generated 26-Aug-2024 • ex er (120 ECTS) Nanostrukturtec	-	page 229 / 268

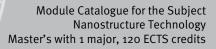




Master's degree (1 major) Economics (2013)

Module title					Abbreviation	
Non-te	chnical	Minor Subject			11-EXNT6-112-m01	
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committee		Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate	Approval by examination	ation committee req	uired.	
Conten	ts					
Non-tee	chnical	minor. Accredited acade	mic achievements, e	.g. in case of change	of university or study abroad.	
Intende	ed lear	ning outcomes				
					ond to the requirements of a mo- law, business sciences).	
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V + R (r	no infor	mation on SWS (weekly o	contact hours) and co	urse language availa	able)	
		e <b>essment</b> (type, scope, langua) le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
in grou weeks)	ps (app or d) p		lidate) or c) project re sentation (approx. 3c	eport (approx. 8 to 10	lidate each or oral examination o pages, time to complete: 1 to 4	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulations	for teaching-degree progra	mmes)		
Module	e appea	in a state of the				
	-	ee (1 major) Nanostructur				
Master	Master's degree (1 major) Nanostructure Technology (2010)					

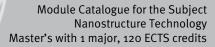
Module title				Abbreviation		
Databa	Databases				10-l-DB-102-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Informatik (Compute	er Science)	Institute of Comput	er Science	
ECTS	1	od of grading	Only after succ. con	· · · ·		
5		rical grade				
Duratio		Module level	Other prerequisites			
1 semesterundergraduateAdmission prerequisite to assessment: exercises (type and scope t announced by the lecturer at the beginning of the course).			scope to be			
Conten	Its	L	ι · ·	5	<u> </u>	
Relatio ment.	nal alg	ebra and complex SQL	statements; database	planning and norma	l forms; transaction	manage-
Intend	ed lear	ning outcomes				
The stu	udents	oossess knowledge ab	out database modelling	g and queries in SQL	as well as transaction	ons.
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Ger	rman)		
			ly contact hours) and co		able)	
			guage — if other than German,			ion on whether
		le for bonus)			, ,	
if anno ced by nutes, Langua	unced an oral groups age of a	examination of one ca of 2: 20 minutes, grou ssessment: German, E	weeks prior to the exan Indidate each or an ora	l examination in grou		
Allocat		Diaces				
 A .J .J .t .t .						
Additio	onal Inf	ormation				
Worklo						
 Teeshi		_				
Teachi	ng cycl	e				
	-		ons for teaching-degree progra	mmes)		
		atenbanksysteme und Datenbanksysteme und				
Module		•	Softwareteennotogie			
		ree (1 major) Computer	Science (2010)			
	-	ree (1 major) Mathema				
	-	ree (1 major) Mathema				
Bachel	Bachelor' degree (1 major) Business Information Systems (2013)					
Bachelor' degree (1 major) Computational Mathematics (2012)						
	Bachelor' degree (1 major) Computational Mathematics (2013)					
	Bachelor' degree (1 major) Aerospace Computer Science (2009)					
	Bachelor' degree (1 major) Aerospace Computer Science (2011)					
	-	ree (1 major) Functiona				
	-	ee (1 major) Computer ee (1 major) Mathemat				
	Jucgi					
Master's w (2010)	ith 1 majo	r Nanostructure Technology		generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 232 / 268



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 (2012) First state examination for the teaching degree Gymnasium Computer Science (2009)

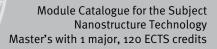
Module title				Abbreviation		
Object-oriented Programming     10-I-OOP-102-m01						
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Informatik (Compute	er Science)	Institute of Comput	er Science	
ECTS		od of grading	Only after succ. con	· · · ·		
5	nume	rical grade		-		
Duratio	n	Module level	Other prerequisites	5		
1 semester       undergraduate       Admission prerequisite to assessment: exercises (type and scope to announced by the lecturer at the beginning of the course).					scope to be	
Conten	ts					
Polymo ment.	orphism	n, generic programming	r, meta programming, v	veb programming, te	mplates, document	manage-
Intende	ed lear	ning outcomes				
The stu their pr		are proficient in the dif use.	erent paradigms of ob	ject-oriented prograr	nming and have exp	erience in
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Ge	rman)		
V + Ü (r	no infoi	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		<b>sessment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
tion da aminat	te, the ion in g ge of a	nation (approx. 50 to 6 written examination ca groups (one candidate ssessment: German, E <b>blaces</b>	n be replaced by an or each: 15 minutes, grou	al examination of on ps of 2: 20 minutes,	e candidate each or	an oral ex-
Additio	nal inf	ormation				
Worklo	ad					
	au					
Teachi		۹				
	ig cycl	C				
Poforro	d to in	LPO I (examination regulati	one for toaching dogroe progr	ammoc)		
Module	annea	urs in				
		ree (1 major) Computer	Science (2010)			
	-	ree (1 major) Mathema				
	-	ree (1 major) Mathema				
	-	ree (1 major) Business		2013)		
Bachelor' degree (1 major) Computational Mathematics (2012)						
Bachelor' degree (1 major) Computational Mathematics (2012)						
Bachel	or' deg	ree (1 major) Aerospace	e Computer Science (20	009)		
Bachel	Bachelor' degree (1 major) Aerospace Computer Science (2011)					
	-	ee (1 major) Computer :				
	-	ee (1 major) Physics (20				
	-	ee (1 major) Physics (20				
Master	's degr	ee (1 major) Nanostruct	ure Technology (2011)			
Master's wi (2010)	ith 1 majo	r Nanostructure Technology	-	e generated 26-Aug-2024 • ex er (120 ECTS) Nanostrukturtec	-	page 234 / 268





Master's degree (1 major) Nanostructure Technology (2010)

Module title				Abbreviation		
Automation and Control Technology				10-I-AR-102-m01		
Module coordinator				Module offered by		
holder	of the (	Chair of Computer Scie	nce VII	Institute of Comput	er Science	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
8	nume	rical grade				
Duratio		Module level	Other prerequisites	i		
1 semesterundergraduateAdmission prerequisite to assessment: exercises (type and scope announced by the lecturer at the beginning of the course).				scope to be		
Conten	Its					
functio structu nes, co	n, plan re of Pe mmuni	t, controller types, bas etri nets, Petri nets for cation between proces	ndamental principles of ic feedback loop, funda automisation, machine as computers and perip nunication, real-time op	amental principles of -related structure of hery devices, softwa	control engineering processing computa re for automation sy	, automata, tion machi-
Intend	ed lear	ning outcomes				
	-		als of automation and c	ontrol.		
			s, language — if other than Gei			
	-		ly contact hours) and co		able)	
module is written tion da aminat	examin examin te, the ion in g	le for bonus) nation (approx. 80 to 9 written examination ca groups. A 80 to 90 min	o minutes). If announc o minutes). If announc on be replaced by an or ute written examinatior ute (approx.) oral exam	ed by the lecturer by al examination of on 1 is equivalent to a 2	four weeks prior to t e candidate each or o minute (approx.) o	the examina- an oral ex- ral examina-
		n groups of 3.				
			nglish if agreed upon w	vith the examiner		
Allocat	ion of <sub>l</sub>	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	immes)		
Module	e appea	urs in				
Bachel	or' deg	ree (1 major) Computer	Science (2010)			
Bachel	Bachelor' degree (1 major) Mathematics (2012)					
	Bachelor' degree (1 major) Mathematics (2013)					
	-		ional Mathematics (20			
	-		ional Mathematics (20	-		
	-		e Computer Science (20 e Computer Science (20	-		
	-	ee (1 major) Computer	•	J11)		
	-	ee (1 major) Computer ee (1 major) Mathemat				
		r Nanostructure Technology	JMU Würzburg •	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 236 / 268



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 Gymnasium Computer Science (2009)

Module	title				Abbreviation
Operati	ing Sys	items			10-I-BS-102-m01
Module	coord	inator		Module offered by	
holder	of the O	Chair of Computer Scienc	e ll	Institute of Computer Science	
ECTS Method of grading Only		Only after succ. com	pl. of module(s)		
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semester       undergraduate         Admission prerequisite to assessment: exercises (type and scop announced by the lecturer at the beginning of the course).					
Conten	ts				
schedu nageme	lers, pr ent, seg	ocess synchronisation, s	emaphores, monitors systems, interfaces, d	s, critical regions, de	eads, cooperating processes, eadlocks, dynamic memory ma- etwork file systems, hard drive
Intende	ed learr	ning outcomes			
The stu	dents p	oossess knowledge and p	oractical skills in buil	ding and using esse	ntial parts of operating systems.
Course	<b>S</b> (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		s <b>essment</b> (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
tion dat aminati	te, the ion in g		be replaced by an ora ch: 15 minutes, group	al examination of on os of 2: 20 minutes,	four weeks prior to the examina- e candidate each or an oral ex- groups of 3: 25 minutes)
Allocati					
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cycl	9			
	<u> </u>				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 69 (1)	1. c) lr	nformatik Technische Info	ormatik		
Module	appea	irs in			
Bachelo	or' degi	ree (1 major) Computer S	cience (2010)		
	-	ree (1 major) Aerospace (	-	-	
		ree (1 major) Aerospace (		011)	
	-	ee (1 major) Computer Sc			
	-	ee (1 major) Physics (201 ee (1 major) Physics (201			
		ee (1 major) Nanostructur			
		ee (1 major) Nanostructur			
	-				

Module	title				Abbreviation	
Compu	ter Arc	hitecture			10-I-RAK-102-m01	
Module	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	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate		site to assessment: ecturer at the beginn		scope to be
Conten	ts					
		t architectures, comma vector processors, mult		pipelining, statical a	and dynamic instruct	tion schedu-
Intende	ed lear	ning outcomes				
		master the most import l operating systems.	ant techniques to desi	gn fast computers as	s well as their intera	ction with
Course	<b>S</b> (type, r	number of weekly contact hours	s, language — if other than Ge	rman)		
V + Ü (r	no infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		<b>Sessment</b> (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informati	ion on whether
tion dat aminati Langua	te, the ion in ន្ ge of a	nation (approx. 50 to 66 written examination ca groups (one candidate 6 ssessment: German, Er	n be replaced by an or each: 15 minutes, grou	al examination of on ps of 2: 20 minutes,	e candidate each or	an oral ex-
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		
§ 69 (1)	1. c) Ir	nformatik Technische Ir	formatik			
Module	e appea	ars in				
	-	ree (1 major) Computer				
	-	ree (1 major) Mathemat				
	-	ree (1 major) Mathemat	-			
	-	ree (1 major) Computat				
	-	ree (1 major) Computat ree (1 major) Aerospace		-		
	-	ree (1 major) Aerospace	•	-		
	-	ee (1 major) Computer S	•	J11)		
	-	ee (1 major) Mathemati				
	-	ee (1 major) Mathemati				
	-	ee (1 major) Physics (20				
	-	ee (1 major) Physics (20				
	th 1 majo	r Nanostructure Technology	-	generated 26-Aug-2024 • ex	-	page 239 / 268
(2010)			ta record Maste	r (120 ECTS) Nanostrukturtec	hnik - 2010	

Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Computational Mathematics (2012)

Module	title				Abbreviation		
Program	nming	of Distributed Systems			10-I=PVS-102-m01		
Module	coord	inator		Module offered by			
holder	of the O	Chair of Computer Science	e ll	Institute of Computer Science			
ECTS Method of grading 0		Only after succ. com	pl. of module(s)				
8	nume	rical grade					
Duratio	n	Module level	Other prerequisites	)ther prerequisites			
1 semes	ster	graduate	Where applicable, p ning of the course (e		ified by the lecturer at the begin- kercises).		
Conten							
Design	and de	velopment of parallely a	nd distributedly exec	uted programs.			
Intende	ed learr	ning outcomes					
		oossess the methodic kno dly running programs.	owledge and practica	I skills for the desig	n and development of parallely		
Courses	<b>S</b> (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)			
V + Ü (n	no infor	mation on SWS (weekly o	contact hours) and co	urse language availa	able)		
		s <b>essment</b> (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
aminati tion of o examin	ion in g one car ation ir	roups. A 80 to 90 minute	e written examination e (approx.) oral exam	is equivalent to a 20 ination in groups of	e candidate each or an oral ex- o minute (approx.) oral examina- 2 and a 40 minute (approx.) oral		
Allocati	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teachir	ng cycl	e					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)			
Module							
Master' Master' Master' Master' Master'	s degre s degre s degre s degre s degre	ee (1 major) Computer Sc ee (1 major) Mathematics ee (1 major) Physics (2010 ee (1 major) Physics (2012 ee (1 major) Nanostructur ee (1 major) Nanostructur mination for the teaching	(2010) c) 1) re Technology (2011) re Technology (2010)	Computer Science (a			
11151 512	ate exd	initiation for the teachillig	degree OyiiiiaSiulli	computer science (2	2009)		

Module	e title				Abbreviation
Artificia	al Intel	ligence			10-l=Kl-102-m01
Module	e coord	inator		Module offered by	
holder	of the (	Chair of Computer Scienc	e VI	Institute of Comput	er Science
ECTS	1	od of grading	Only after succ. com	· · ·	
8		rical grade			
Duratio		Module level	Other prerequisites		
				roroquisitos os spos	ified by the lesturer at the basin
1 semester graduate		graduate	ning of the course (e		ified by the lecturer at the begin- xercises).
Conten	ts				
propos Bayesia	itional an netv	and predicate logic and i	nference, knowledge ecidability problems,	representation, plan , learning from obse	, search with partial information, nning, probabilistic closure and rvations, knowledge while lear-
Intende	ed lear	ning outcomes			
		possess theoretical and p or its application.	oractical knowledge a	bout artificial intelli	gence and are able to assess
Course	<b>S</b> (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
V + Ü (r	no infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
tion da aminat	te, the ion in ន្		be replaced by an ora ch: 15 minutes, group	al examination of on os of 2: 20 minutes,	four weeks prior to the examina- e candidate each or an oral ex- groups of 3: 25 minutes)
Allocat					
Additio	nal inf	ormation			
Worklo					
WORKIO	au				
 Teachii	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	e appea	ars in			
		ee (1 major) Computer Sc	ience (2010)		
	-	ee (1 major) Mathematics			
Master	's degr	ee (1 major) Mathematics	(2010)		
Master	's degr	ee (1 major) Physics (201	o)		
Master	's degr	ee (1 major) Physics (201	1)		
Master	's degr	ee (1 major) Nanostructur	re Technology (2011)		
Master	's degr	ee (1 major) Nanostructur	e Technology (2010)		
Master	's degr	ee (1 major) Computation	al Mathematics (2012	2)	
First sta	ate exa	mination for the teaching	degree Gymnasium	Computer Science (2	2009)

Module	title				Abbreviation
Databa	ses II				10-l=DB2-102-m01
Module	e coord	inator		Module offered by	
Dean of	f Studi	es Informatik (Computer S	Science)	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio		Module level	Other prerequisites		
1 seme:	ster	graduate	Where applicable, p ning of the course (e		ified by the lecturer at the begin- kercises).
Conten	ts				
Data wa	arehou	ses and data mining; XM	L databases; web dat	tabases;introductior	n to Datalog.
		ning outcomes			
The stu	dents l	have advanced knowledg	e about relational da	tabases, XML and da	ata mining.
		number of weekly contact hours, la	-		<u> </u>
		mation on SWS (weekly o			able)
Method	l of ass	· · ·			t every semester, information on whether
tion dat aminati	te, the ion in ខ្ន		be replaced by an ora ch: 15 minutes, group	al examination of on os of 2: 20 minutes,	four weeks prior to the examina- e candidate each or an oral ex- groups of 3: 25 minutes)
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cvcl	e			
	0 . 7	-			
Referre	d to in	<b>LPO I</b> (examination regulations	for teaching-degree progra	mmes)	
	<u>u to in</u>				
Module	e appea	ars in			
Master Master Master Master Master Master Master Master Master	s degri s degri s degri s degri s degri s degri s degri s degri s degri s degri	ee (1 major) Computer Sc ee (1 major) Mathematics ee (1 major) Mathematics ee (1 major) Physics (2010 ee (1 major) Physics (2010 ee (1 major) Nanostructur ee (1 major) Nanostructur ee (1 major) Business Info ee (1 major) Business Info ee (1 major) Computation ee (1 major) Functional M	5 (2012) 5 (2010) 6) 1) re Technology (2011) re Technology (2010) formation Systems (20 formation Systems (20 al Mathematics (2012)	013) 2)	2000)
riist sta	ale exa	mination for the teaching	guegree Gymnasium	computer Science (2	2009)

Module	e title				Abbreviation
Program	m Desiş	gn and Analysis			10-I=PA-102-m01
Module	e coordi	inator		Module offered by	
holder	of the C	Chair of Computer Science	e ll	Institute of Comput	er Science
ECTS	Metho	od of grading	Only after succ. compl. of module(s)		
5	numei	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate	Where applicable, p ning of the course (e		ified by the lecturer at the begin- vercises).
Conten	ts				
Program	n analy	sis, model creation in so	ftware engineering, p	rogram quality, test	of programs, process models.
		ning outcomes			· · ·
	dents a	-	ams, to use testing fra	ameworks and metri	cs as well as to judge program
Course	<b>S</b> (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	urse language availa	able)
Method	l of ass	· · ·			t every semester, information on whether
tion dat aminati	te, the ion in g ge of a	written examination can roups (one candidate ea ssessment: German, Eng	be replaced by an ora ch: 15 minutes, group	al examination of on os of 2: 20 minutes,	four weeks prior to the examina- e candidate each or an oral ex- groups of 3: 25 minutes)
	<u> </u>				
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cycle	9			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	e appea	irs in			
Master' Master' Master' Master' Master' Master' Master' Master'	s degre s degre s degre s degre s degre s degre s degre s degre s degre s degre	ee (1 major) Computer Sc ee (1 major) Mathematics ee (1 major) Mathematics ee (1 major) Physics (2010 ee (1 major) Physics (2012 ee (1 major) Nanostructur ee (1 major) Nanostructur ee (1 major) Business Info ee (1 major) Business Info ee (1 major) Computation	(2012) (2010) b) re Technology (2011) re Technology (2010) formation Systems (20 formation Systems (20 al Mathematics (2012)	2)	
First sta	ate exa	mination for the teaching	degree Gymnasium	Computer Science (2	2009)

Module	e title				Abbreviation
Applied	l Analy	sis			10-M=AAAN-102-m01
Module	coord	inator		Module offered by	
Dean of	f Studie	es Mathematik (Mathema	atics)	Institute of Mathematics	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
10	nume	rical grade			
Duratio		Module level	Other prerequisites		
1 seme	ster	graduate	ning of the course o the specified registr to qualify for admiss certain percentage o the respective detai exercise will be con- sessment. If student assessment over the gistration for assess will be admitted to a	r as announced by th ation deadlines. Cer sion to assessment ( of exercises). The lec ls at the beginning of sidered a declaration ts have obtained the e course of the seme sment into effect. Stu assessment in the cu t at a later date, stud	ade via SB@home at the begin- he lecturer in accordance with tain prerequisites must be met (e. g. successful completion of a cturer will inform students about of the course. Registration for the n of will to seek admission to as- e qualification for admission to ester, the lecturer will put their re- udents who meet all prerequisites urrent or in the subsequent seme- dents will have to obtain the qua-
theory of particul	h study of Hilbe lar FEM	ert spaces and Fourier an methods), principles of	alysis, spectral theor functional analysis, f	y and quantum mec unction spaces, eml	oartial differential equations, hanics, numerical methods (in bedding theorems, compactness, ethods from functional analysis.
		d previous knowledge: h the contents of the mo	dule "Functional Anal	lysis" is strongly reco	ommended.
Intende	ed learr	ning outcomes			
to estal	blish a		/her acquired skills a		of higher analysis. He/She is able f mathematics and questions in
Course	<b>S</b> (type, n	umber of weekly contact hours, I	anguage — if other than Ger	man)	
		mation on SWS (weekly			able)
Method	l of ass	· · · · · ·			ot every semester, information on whether
examin nation i Assess semest	ation ( in grou ment o er, cou	90 to 120 minutes), b) or ps (groups of 2, approx.	al examination of one 30 minutes) ed in the semester in r every four semester	e candidate each (ap which the course is	hods of assessment: a) written oprox. 20 minutes), c) oral exami- offered and in the subsequent
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				

### Teaching cycle

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

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# Module appears in

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

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) Economathematics (2011)

Master's degree (1 major) Mathematical Physics (2012)

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

Module	e title				Abbreviation	
Comple	ex Anal	ysis			10-M=AFTH-102-m	101
Module	e coord	inator		Module offered by		
Dean o	of Studi	es Mathematik (Mather	matics)	Institute of Mathem	natics	
ECTS	Meth	od of grading	Only after succ. co	mpl. of module(s)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites	5		
1 seme	ester	graduate	ning of the course of the specified regist to qualify for admiss certain percentage the respective deta exercise will be cor sessment. If studer assessment over th gistration for asses will be admitted to ster. For assessment	exercise must be may or as announced by the ration deadlines. Cer- ssion to assessment ( of exercises). The lec- ils at the beginning of sidered a declaration the have obtained the secourse of the seme sment into effect. Stu- assessment in the cu- nt at a later date, stud	ne lecturer in accor tain prerequisites in (e. g. successful con- turer will inform str of the course. Regis n of will to seek adure qualification for a ester, the lecturer wo udents who meet al urrent or in the sub- dents will have to o	dance with must be met mpletion of a udents about tration for the mission to as- dmission to rill put their re- ll prerequisites sequent seme
			lification for admis	sion to assessment a	new.	
Basic k Intende The stu ticular betwee	ed lear adent is the (ge en his/l	d previous knowledge: dge of the contents of the ning outcomes s acquainted with the fu ometric) mapping prop her acquired skills and number of weekly contact hour	he module "Introductio Indamental notions, m erties of holomorphic other branches of mat	nethods and results of functions. He/She is hematics and applica	f higher complex a able to establish a	nalysis, in par connection
V + Ü (r	no info	rmation on SWS (weekl	v contact hours) and c	ourse language avail	able)	
module is At the b examin nation Assess semest	s creditat beginni nation ( in grou sment o ter, cou	sessment (type, scope, lang ole for bonus) ing of the course, the le 90 to 120 minutes), b) 105 (groups of 2, approx 105 offered: Assessment off 105 offered on demand 105 sessment: German, E	ecturer will choose one oral examination of on (. 30 minutes) ered in the semester in or every four semeste	of the following met e candidate each (ap n which the course is	hods of assessmer oprox. 20 minutes),	nt: a) written c) oral exami-
Allocat						
	onal inf	ormation				
Worklo	ad					
Master's w 2010)	vith 1 majo	r Nanostructure Technology	-	• generated 26-Aug-2024 • ex er (120 ECTS) Nanostrukturtec	-	page 247 / 268

### Teaching cycle

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

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## Module appears in

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

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) Mathematical Physics (2012)

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

	e title				Abbreviation
Groups	s and th	neir Representations			10-M=VGDS-102-m01
Modul	e coord	inator		Module offered by	
Dean o	of Studi	es Mathematik (Mathema	atics)	Institute of Mathen	natics
ECTS Method of grading		Only after succ. compl. of module(s)			
10	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
	nts		ning of the course o the specified registr to qualify for admiss certain percentage of the respective detai exercise will be con- sessment. If studen assessment over the gistration for assess will be admitted to a ster. For assessmen lification for admiss	r as announced by t ation deadlines. Cer sion to assessment of exercises). The lec ls at the beginning of sidered a declaratio ts have obtained the e course of the seme sment into effect. Str assessment in the cr t at a later date, stru- ion to assessment a	ade via SB@home at the begin- he lecturer in accordance with tain prerequisites must be met (e. g. successful completion of a cturer will inform students about of the course. Registration for the n of will to seek admission to as- e qualification for admission to ester, the lecturer will put their re udents who meet all prerequisite urrent or in the subsequent seme dents will have to obtain the qua new.
Basic k "Applie	knowled ed Alge	bra".	d, such as can be acc	quired in the module	s "Introduction to Algebra" and
Basic k "Applie <b>Intend</b> e The stu rary res	knowled ed Alge <b>ed lear</b> udent m search	dge of algebra is assume bra". <b>ning outcomes</b> nasters advanced algebra	ic concepts and metl	hods. He/She gains	-
Basic k "Applie Intende The stu rary res blems.	knowled ed Alge ed lear udent m search	dge of algebra is assume bra". <b>ning outcomes</b> nasters advanced algebra questions in group theor	ic concepts and meth y and representation	hods. He/She gains theory and can appl	the ability to work on contempo-
Basic k "Applie Intende The stu rary res blems. Course	knowled ed Alge ed lear udent m search es (type, r	dge of algebra is assume bra". ning outcomes nasters advanced algebra questions in group theory	ic concepts and meth y and representation anguage — if other than Ger	hods. He/She gains theory and can appl man)	the ability to work on contempo- y his/her skills to complex pro-
Basic k "Applie Intende The stu rary res blems. Course V + Ü (n	knowled ed Alge ed lear udent m search search search no info	dge of algebra is assume bra". ning outcomes nasters advanced algebra questions in group theor number of weekly contact hours, l rmation on SWS (weekly	ic concepts and meth y and representation anguage — if other than Ger contact hours) and co	hods. He/She gains theory and can appl <sup>man)</sup> ourse language avail	the ability to work on contempo- y his/her skills to complex pro- able)
Basic k "Applie Intendo The stu rary res blems. Course V + Ü (i Metho	knowled ed Alge ed lear udent m search es (type, m no infoi d of ass	dge of algebra is assume bra". ning outcomes nasters advanced algebra questions in group theor number of weekly contact hours, l rmation on SWS (weekly	ic concepts and meth y and representation anguage — if other than Ger contact hours) and co	hods. He/She gains theory and can appl <sup>man)</sup> ourse language avail	the ability to work on contempo- y his/her skills to complex pro-
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### Teaching cycle

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

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## Module appears in

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

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) Mathematical Physics (2012)

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

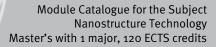
Numei	le title				Abbreviation	
	ric of Pa	rtial Differential Equat	tions		10-M=VNPE-102-mc	01
Modul	le coord	linator		Module offered by		
Dean (	of Studi	es Mathematik (Mathe	matics)	Institute of Mathem	natics	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
10		rical grade		· · · ·		
Durati		Module level	Other prerequisites			
1 seme	ester	graduate	ning of the course o the specified registr to qualify for admiss certain percentage o the respective detai exercise will be con sessment. If studen assessment over the gistration for assess will be admitted to a	r as announced by the ration deadlines. Cer sion to assessment ( of exercises). The lead its at the beginning of sidered a declaration ts have obtained the e course of the seme sment into effect. Str assessment in the co	ade via SB@home at the lecturer in accorda tain prerequisites m (e. g. successful com turer will inform stud of the course. Registra n of will to seek adm e qualification for ada ester, the lecturer wil udents who meet all urrent or in the subsected ents will have to ob	ance with ust be met pletion of a dents about ation for the ission to as- mission to l put their re prerequisite equent seme
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red in Intend The stu Course	commer the mod led lear udent is es (type, 1	nd basic knowledge of dules "Introduction to I ning outcomes s acquainted with adva number of weekly contact hour	functional analysis and Functional Analysis" and Inced methods for discr	d "Applied Analysis" etising partial differe	ential equations.	an be acqui-
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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

#### Module appears in

Master's degree (1 major) Mathematics (2012) 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 (2010) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Economathematics (2011) Master's degree (1 major) Mathematical Physics (2012) Master's degree (1 major) Computational Mathematics (2012)

Module	e title				Abbreviation	
Quantu	um Con	trol and Quantum Com	outing		10-M=VQKC-102-m	01
Module	a coord	inator		Module offered by		
		es Mathematik (Mather	natics)	Institute of Mathem	natics	
ECTS	1	od of grading	Only after succ. com			
5	1	rical grade				
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate	Registration for the ning of the course o the specified registr to qualify for admiss certain percentage o the respective detai exercise will be cons sessment. If student assessment over the gistration for assess will be admitted to a ster. For assessmen lification for admiss	r as announced by th ation deadlines. Cer sion to assessment ( of exercises). The lec ls at the beginning of sidered a declaration ts have obtained the e course of the seme sment into effect. Str assessment in the cu t at a later date, stud	he lecturer in accord tain prerequisites m (e.g. successful com turer will inform stu of the course. Registe n of will to seek adm e qualification for ad ester, the lecturer will udents who meet all urrent or in the subse dents will have to ob	ance with nust be met npletion of a dents about ration for the nission to as- mission to Il put their re- prerequisites equent seme-
Conten			lification for admiss	ion to assessment a	new.	
system comput Intende The stut to work Course	is and/ ting or ed learn ident is c on con	Neumann equation), bi or infinite-dimensional magnetic resonance sp ning outcomes acquainted with advar ntemporary research qu number of weekly contact hours	Schrödinger equations ectroscopy). nced methods in quant estions in and applica	um-mechanical control tions of control system man)	ol), applications (e. s trol systems. He gair ems in quantum me	g. in quantum
1) U + V	no infoi	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		s <b>essment</b> (type, scope, lang le for bonus)	uage — if other than German, e	examination offered — if no	ot every semester, informat	ion on whether
examin nation Assess semest	nation ( in grou ment o ter, cou	ng of the course, the le 60 to 90 minutes), b) o ps (groups of 2, approx ffered: Assessment offo rse offered on demand ssessment: German, En	ral examination of one . 20 minutes) ered in the semester in or every four semester	candidate each (app which the course is	prox. 15 minutes), c)	oral exami-
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
 Teachi	ng cycl	e				
 Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
			ini teaching-degree progra			
Master's w	ith 1 majo	Nanostructure Technology	_	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	am. reg. da-	page 253 / 268



# Module appears in

Master's degree (1 major) Mathematics (2012) 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 (2010) Master's degree (1 major) Mathematical Physics (2012)

Module	e title				Abbreviation
Basic C	Course	German Civil Code 1			02-N-P-G1-101-m01
Module	e coord	inator		Module offered by	
Dean o	f Studi	es Faculty of Law		Faculty of Law	
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	ster	undergraduate	Admission prerequi rium.	site to assessment:	regular attendance of conversato-
Conten	Its				
Cormo	n conto	nte available but not tra	nclated yet		

German contents available but not translated yet.

Der Grundkurs Bürgerliches Recht 1 führt die Studierenden in das Privatrecht ein. Er bietet eine systematische Darstellung des Allgemeinen Teils des Bürgerlichen Gesetzbuches sowie wichtiger Fragen des Schuldrechts, Allgemeiner Teil.

#### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden haben umfassende Kenntnisse auf dem Gebiet des Allgemeinen Teils des Bürgerlichen Gesetzbuchs erworben. Neben der Auseinandersetzung mit Problemen des Allgemeinen Teils, lernten sie die Systematik des BGB kennen und erlernten das Arbeiten mit juristischen Fällen anhand von Beispielen.

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

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

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

a) written examination (approx. 120 minutes) or b) oral examination (approx. 15 minutes)

#### Allocation of places

Degree programm law (degree "Erste Juristische Staatsprüfung") and Bachelor's Privatrecht (Private Law) (minor with 60 ECTS credits): no restrictions. Students of other degree programmes: 20 places. Places will be allocated as follows: Students applying after not having successfully completed assessment in in the last two semesters will be given preferential consideration. The remaining places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

Additional information

#### Workload

**Teaching cycle** 

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

Module appears in

Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Bachelor's degree (1 major, 1 minor) Private Law (Minor, 2011)

Module title					Abbreviation
Basic Course German Civil Code 2a and 2 b					02-N-P-G2-101-m01
Module	e coord	inator		Module offered by	
Dean of Studies Faculty of Law				Faculty of Law	
ECTS	Metho	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			
Conten	its				

German contents available but not translated yet.

Der Grundkurs Bürgerliches Recht 2.1 erschließt den für das Bürgerliche Recht zentralen Bereich des Allgemeinen Schuldrechts einschließlich der Leistungsstörungen sowie die wichtigsten Fragen der vertraglichen Schuldverhältnisse. Die Vorlesung Grundkurs Bürgerliches Recht 2.2 behandelt die gesetzlichen Schuldverhältnisse Geschäftsführung ohne Auftrag, Bereicherungsrecht und Deliktsrecht.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden verfügen über grundlegendes Wissen auf dem Gebiet des Schuldrechts des Bürgerlichen Gesetzbuchs (§§241-432 BGB). Sie haben insbesondere Kenntnisse auf dem Gebiet des Leistungsstörungsrechts erworben und sich mit den bedeutendsten vertraglichen Schuldverhältnissen wie dem Kaufvertrag, Werkvertrag, Darlehensvertrag und der Bürgschaft sowie den gesetzlichen Schuldverhältnissen auseinandergesetzt. Die Studierenden erlernten anhand von ausgewählten Problemen des Schuldrechts das juristische Arbeiten.

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

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

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

written examination (approx. 120 minutes)

**Allocation of places** 

Degree programm law (degree "Erste Juristische Staatsprüfung") and Bachelor's Privatrecht (Private Law) (minor with 60 ECTS credits): no restrictions. Students of other degree programmes: 20 places. Places will be allocated as follows: Students applying after not having successfully completed assessment in in the last two semesters will be given preferential consideration. The remaining places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

#### **Additional information**

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Workload

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Teaching cycle

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

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### Module appears in

Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Bachelor's degree (1 major, 1 minor) Private Law (Minor, 2011)

Module title				Abbreviation	
Basic Course	German Civil Code 3			02-N-P-G3-101-m01	
Module coord	inator		Module offered by		
Dean of Studie	es Faculty of Law	Faculty of Law			
ECTS Metho	od of grading	Only after succ. compl. of module(s)			
10 nume	rical grade				
Duration	Module level	Other prerequisites			
1 semester	undergraduate	Admission prerequis	site to assessment: ı	regular attendance of conversato-	
Contents					
German conte	nts available but not tran	slated yet.			
Gegenstand d rechts vermitt		Buch des BGB. Es wer	rden die Grundlagen	auf dem Gebiet des Sachen-	
Intended learn	ning outcomes				
German intend	ded learning outcomes av	vailable but not trans	lated yet.		
sondere Kenn das allgemein Rechtsverhält	tnisse über Rechtsfragen e Grundstücksrecht, den	zu Besitz und Besitz Eigentumserwerb an und Besitzer und bes	schutz, das Eigentur Grundstücken und a schränkt dingliche R	nts erworben. Sie haben insbe- n und Fragen des Nachbarrechts, an beweglichen Sachen, das echte, wie die Dienstbarkeiten	
Courses (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V + o (no infor	mation on SWS (weekly o	contact hours) and co	ourse language availa	able)	
Method of ass module is creditab		ge — if other than German, e	examination offered — if no	t every semester, information on whether	
a) written exar	mination (approx. 120 mi	nutes) or b) oral exan	nination (approx. 15	minutes)	
Allocation of p	olaces				
with 60 ECTS of as follows: Stu will be given p	credits): no restrictions. S udents applying after not	Students of other deg having successfully . The remaining place	ree programmes: 20 completed assessme	Privatrecht (Private Law) (minor places. Places will be allocated ent in in the last two semesters by lot. A waiting list will be main-	
Additional info	ormation				
Workload					
Teaching cycl	e				
Referred to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module appea					
-	ee (1 major) Nanostructur				
-	ee (1 major) Nanostructur gree (1 major, 1 minor) Pri		.1)		
	<u> </u>		,		

Module	e title				Abbreviation	
Germa	n and E	uropean Trade Mark La	w		02-N-P-W06-111-mc	)1
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Faculty of Law		Faculty of Law		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
3	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
Germai	n conte	nts available but not tr	anslated yet.			
gen de: Wirkun werder	s Marko gen de Spezia	enbegriffs und -schutze r Europäischen Gemeir alregelungen des deuts	lick über das Deutsche es nach dem deutschen ischaftsmarke nach de schen Markenrechts wie kennzeichenrechtliche	Markengesetz werd r Gemeinschaftsmar e z.B. zu geschäftlich	len u.a. die Vorausse kenverordnung beha nen Bezeichnungen,	etzungen und andelt. Ferner geographi-
Intende	ed lear	ning outcomes				
			available but not trans	lated yet.		
		den können markenrec analysieren.	htliche Fragestellunger	n unter Gesichtspunl	kten des deutschen	und europäi-
Course	<b>S</b> (type, r	number of weekly contact hour	s, language — if other than Ger	man)		
V (no ir	nformat	tion on SWS (weekly co	ntact hours) and cours	e language available	e)	
Metho	d of ass	sessment (type, scope, lang	guage — if other than German, e	examination offered — if no	ot every semester, informat	on on whether
		le for bonus)				
			minutes) or b) oral exar /ear, summer semester		minutes)	
Allocat	ion of <sub>l</sub>	olaces				
with 60 as follo will be	e ECTS ws: Stu given p	credits): no restrictions udents applying after n	Juristische Staatsprüfu Students of other deg ot having successfully on. The remaining place by become available.	ree programmes: 20 completed assessm	places. Places will l ent in in the last two	be allocated semesters
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	mmes)		
Module	e appea	ars in				
	-	ee (1 major) Nanostruc				
	-	ee (1 major) Nanostruc ee (1 major) Media Con				
master	s uegi	ee (1 major) meura Con	iniunication (2014)			
Master's w (2010)	ith 1 majo	r Nanostructure Technology	-	generated 26-Aug-2024 • ex r (120 ECTS) Nanostrukturtec	-	page 258 / 268

Module	e title				Abbreviation
Copyri	ght Lav	<i>v</i> and Fundamentals of I	02-N-P-W07-111-m01		
Module	e coord	inator		Module offered by	
Dean o	f Studi	es Faculty of Law		Faculty of Law	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
2	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	its				

German contents available but not translated yet.

Die Veranstaltung behandelt neben den allgemeinen Grundlagen des Gewerblichen Rechtsschutzes den Schutz von Werken nach dem deutschen Urhebergesetz. In einem weiteren Veranstaltungsteil werden das Geschmacksmusterrecht sowie das Patent- und Gebrauchsmusterrecht beleuchtet.

### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Die Studierenden haben grundlegende Kenntnisse des Gewerblichen Rechtsschutzes und des Urheberrechts erworben. Sie können Problematiken aus diesen Bereichen in den Kontext der deutschen und europäischen Regelungen einordnen.

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

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

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

a) written examination (approx. 120 minutes) or b) oral examination (approx. 15 minutes) Assessment offered: usually once a year, summer semester

### **Allocation of places**

Degree programm law (degree "Erste Juristische Staatsprüfung") and Bachelor's Privatrecht (Private Law) (minor with 60 ECTS credits): no restrictions. Students of other degree programmes: 20 places. Places will be allocated as follows: Students applying after not having successfully completed assessment in in the last two semesters will be given preferential consideration. The remaining places will be allocated by lot. A waiting list will be maintained and places re-allocated as they become available.

### Additional information

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## Workload

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## **Teaching cycle**

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

## Module appears in

Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Media Communication (2014) Master's degree (1 major) Economics (2014) Master's degree (1 major) Economics (2013)

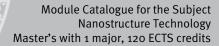
Master's with 1 major Nanostructure Technolo	ogy
(2010)	

	e title				Abbreviation
Additio	onal Qu	alifications for Engineers	S		11-EXZ5-111-m01
Module	e coord	inator		Module offered by	
chairpe	erson o	f examination committee		Faculty of Physics a	nd Astronomy
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate	Approval by examin	ation committee req	uired.
Conten	ts		1		
Additio abroad		lls for engineers. Accredi	ted academic achiev	ements, e.g. in case	of change of university or study
Intende	ed lear	ning outcomes			
gree pro or indu	ogram strial r	me of Nanostructure Tech esearch.	nnology. They have qu	ualifying knowledge	of a module of the Master's de- for an occupation in the industry
		number of weekly contact hours,			
V + R (n	no info	mation on SWS (weekly	contact hours) and co	ourse language avail	able)
Method	d of as				
module is	s creditat	le for bonus)			t every semester, information on whether
a) writte less oth minute prox. 8 tes)	en exa nerwise s per c to 10 p	<sup>le for bonus)</sup> mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi	inutes, for modules w mination of one cand th less than 4 ECTS c 1 to 4 weeks) or d) pr	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-
a) writte less oth minute prox. 8 tes)	en exa herwise s per c to 10 p	nle for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi bages, time to complete: ussessment: German, Eng	inutes, for modules w mination of one cand th less than 4 ECTS c 1 to 4 weeks) or d) pr	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minute prox. 8 tes) Langua	en exa herwise s per c to 10 p	nle for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi bages, time to complete: ussessment: German, Eng	inutes, for modules w mination of one cand th less than 4 ECTS c 1 to 4 weeks) or d) pr	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minutes prox. 8 tes) Langua Allocat	en exa nerwise s per c to 10 p nge of a ion of	nle for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi bages, time to complete: ussessment: German, Eng	inutes, for modules w mination of one cand th less than 4 ECTS c 1 to 4 weeks) or d) pr	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minutes prox. 8 tes) Langua Allocat	en exa nerwise s per c to 10 p nge of a ion of	nle for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi pages, time to complete: issessment: German, Eng places	inutes, for modules w mination of one cand th less than 4 ECTS c 1 to 4 weeks) or d) pr	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minutes prox. 8 tes) Langua Allocat	en exa herwise s per c to 10 p ge of a <b>ion of</b> p	nle for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi pages, time to complete: issessment: German, Eng places	inutes, for modules w mination of one cand th less than 4 ECTS c 1 to 4 weeks) or d) pr	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minutes prox. 8 tes) Langua Allocat  Additio	en exa herwise s per c to 10 p ge of a <b>ion of</b> p	nle for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi pages, time to complete: issessment: German, Eng places	inutes, for modules w mination of one cand th less than 4 ECTS c 1 to 4 weeks) or d) pr	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minutes prox. 8 tes) Langua Allocat  Additio	en exa herwise s per c to 10 p ge of a ion of p mal inf	nle for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi bages, time to complete: issessment: German, Eng places	inutes, for modules w mination of one cand th less than 4 ECTS c 1 to 4 weeks) or d) pr	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minute prox. 8 tes) Langua Allocat  Additio  Worklo	en exa herwise s per c to 10 p ge of a ion of p mal inf	nle for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi bages, time to complete: issessment: German, Eng places	inutes, for modules w mination of one cand th less than 4 ECTS c 1 to 4 weeks) or d) pr	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minute prox. 8 tes) Langua Allocat  Additio  Worklo  Teachin 	en exa herwise s per c to 10 p ge of a ion of p nal inf	nle for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi bages, time to complete: issessment: German, Eng places	inutes, for modules w mination of one cand ith less than 4 ECTS c 1 to 4 weeks) or d) pr glish	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi esentation/seminar	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
module is a) writte less oth minute prox. 8 tes) Langua Allocat  Additio  Worklo  Teachin 	en exa herwise s per c to 10 p ge of a ion of p nal inf	e for bonus) mination (approx. 120 mi e specified) or b) oral exa andidate, for modules wi bages, time to complete: essessment: German, Eng places ormation	inutes, for modules w mination of one cand ith less than 4 ECTS c 1 to 4 weeks) or d) pr glish	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi esentation/seminar	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minute prox. 8 tes) Langua Allocat  Additio  Worklo  Teachin 	ereditation en exa herwise s per c to 10 p ge of a ion of p mal inf mad	e e e e specified) or b) oral exa andidate, for modules wi bages, time to complete: ssessment: German, Eng places ormation e LPOI (examination regulation	inutes, for modules w mination of one cand ith less than 4 ECTS c 1 to 4 weeks) or d) pr glish	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi esentation/seminar	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-
a) writte less oth minutes prox. 8 tes) Langua Allocat  Worklo  Teachir  Referre  Module	en exa herwise s per c to 10 p nge of a ion of p mal inf ad	e e e e specified) or b) oral exa andidate, for modules wi bages, time to complete: ssessment: German, Eng places ormation e LPOI (examination regulation	inutes, for modules w mination of one cand ith less than 4 ECTS c 1 to 4 weeks) or d) pr glish	vith less than 4 ECTS didate each or oral ex redits approx. 20 mi esentation/seminar	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap-

Module	e title				Abbreviation
Additio	onal Qu	alifications for Engineer	S		11-EXZ6-111-m01
Module	e coord	inator		Module offered by	
chairpe	erson o	f examination committee	2	Faculty of Physics a	and Astronomy
ECTS	Methe	od of grading	Only after succ. con	npl. of module(s)	
6	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate	Approval by examin	ation committee req	uired.
Conten	ts				
Additio abroad		lls for engineers. Accred	ited academic achiev	ements, e.g. in case	of change of university or study
Intende	ed lear	ning outcomes			
gree pr or indu	ogrami strial r	me of Nanostructure Tecl esearch.	nnology. They have qu	ualifying knowledge	of a module of the Master's de- for an occupation in the industry
		number of weekly contact hours, mation on SWS (weekly			
a) writt less oth minute prox. 8 tes)	en exa herwise s per c to 10 p	e specified) or b) oral exa andidate, for modules w	amination of one canc ith less than 4 ECTS c 1 to 4 weeks) or d) pr	lidate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- xamination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-
Allocat	ion of <sub>l</sub>	places			
	-				
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	mmes)	
Module	e appea	ars in			
Master	-	ee (1 major) Nanostructu	re Technology (2011)		
		ee (1 major) Nanostructu	•, · ·		

Module title				Abbreviation
Employment	law for non-law students			02-J7-112-m01
Module coord	linator		Module offered by	
	Chair of Civil Law, Employ	yment and Labour	Faculty of Law	
Law and Civil		F		
	od of grading	Only after succ. con	npl. of module(s)	
	erical grade			
Duration	Module level	Other prerequisites		
1 semester	undergraduate			
Contents				
German conte	ents available but not trai	nslated yet.		
Die Veranstal rechts.	tung Arbeitsrecht für Stu	dierende anderer Fac	nrichtungen vermitte	elt die Grundlagen des Arbeits-
Intended lear	ning outcomes	_		
	ded learning outcomes a	vailable but not trans	lated yet.	
Die Studieren plizieren.	iden haben gelernt, arbei	tsrechtliche Grundlag	gen auf ein späteres	berufliches Handlungsfeld zu ap-
	number of weekly contact hours,	language — if other than Ge	rman)	
V (no informa	tion on SWS (weekly con	tact hours) and cours	e language available	e)
Method of as module is credital		age — if other than German,	examination offered — if no	ot every semester, information on whether
	ination (approx. 120 minu offered: once a year, wint			
Allocation of	places			
past two sem ting list will b	esters will be given prefe	rential consideration re-allocated by lot as	. The remaining plac they become availa	y completed assessment in the es will be allocated by lot. A wai- ble. Places on all courses of the ame procedure.
Additional in	formation			
Workload				
Teaching cyc	le			
Referred to ir	LPOI (examination regulation	s for teaching-degree progra	immes)	
Module appe	ars in			
	ree (1 major) Nanostructu			
Master's degr	ree (1 major) Nanostructu	re Technology (2010)		

Module	e title				Abbreviation	
Informa	ation Li	teracy for Students of t	he Natural Sciences (I	Basic Level)	41-IK-NW1-101-m01	
Module	e coord	inator		Module offered by		
head o	f Unive	rsity Library	- <b>F</b>	University Library		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
2	(not) s	successfully completed				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	undergraduate				
Conten	ts					
- Searc - Using - Resou - Online - Overv - Refere	h strate the lib irces fo e searc iew of a ence ma	eracy in an academic c egies and tools. rary's electronic resourd r natural sciences: data hes and search engines additional resources (el anagement. Some secti in the natural sciences	ces. bases and journals. earning etc.). ons of the module will	focus on particular o	disciplines (whereve	r possible,
	· · · · · · · · · · · · · · · · · · ·	ning outcomes	)			
within differen ses) an they ha	their di nce in c d infor ive four	w what information is no scipline and beyond in quality between informa mation they have found nd, using reference mar needed to find informa	a variety of resources tion they have retrieve on the free web. Stud agement software and	and to evaluate this ed from specific, rest ents are able to man d eLearning tools. Th	information. They re ricted access resour age and process the e module aims to ec	cognise the ces (databa- e information juip students
Course	<b>S</b> (type, n	umber of weekly contact hours	, language — if other than Ge	rman)		
Ü (no ir	nformat	tion on SWS (weekly co	ntact hours) and cours	e language available	2)	
Metho	d of ass	<b>essment</b> (type, scope, lang	uage — if other than German,	examination offered — if no	t every semester, informat	ion on whether
		le for bonus)				
10 min sentati prox. 5	utes or on with minute	mination (approx. 60 m approx. 5 minutes and yout slides (approx. 20 f es) and completing exer and completing exercises	approx. 1 page) or c) c to 30 minutes) or e) pr cises (approx. 5 exerci	ompleting exercises eparing and deliverir	(approx. 10 exercise ng a presentation wi	s) or d) pre- th slides (ap-
Allocat	ion of p	olaces				
Studen ration. science to the r	ts of th The rer es degr number	ces: 5-50. There is a res e degree programmes o naining places, if and w ee programmes. In each of subject semesters. <i>i</i> y lot. The remaining 70	of the respective subje when any become avail n of the above-mentior Among applicants with	ct-specific focuses w able, will be allocate ned groups, 30% of p the same number o	vill be given preferen ed to students of the places will be allocat	tial conside- other natural ed according
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPOI (examination regulation	ns for teaching-degree progra	immes)		
Master's w (2010)	ith 1 majoi	Nanostructure Technology		generated 26-Aug-2024 • exa r (120 ECTS) Nanostrukturtec	-	page 263 / 268



# Module appears in

Bachelor' degree (1 major) Biochemistry (2011) Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Biochemistry (2009) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010) No final examination Special study offering (2010)

	e title				Abbreviation
Inform	ation Li	iteracy for Students of th	e Natural Sciences (A	Advanced Level)	41-IK-NW2-101-m01
Modul	e coord	inator		Module offered by	,
head o	of Unive	rsity Library		University Library	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
2	(not) s	successfully completed			
Duratio	on	Module level	Other prerequisites	i	
1 seme	ester	undergraduate	Knowledge and skil desirable.	ls equivalent to tho	se achieved in the basic module
Conten	nts				
- Publis - Subje - New v - Searc - Inforn - Copyr - Electr	shing a ect-spec web-bas ching fo nation s right an ronic pu		tools, e.g. classifica munication technolo e.g. substances and p place.	tions and thesauri. gies. physical data).	rever possible, on disciplines in
		iences).			
		ning outcomes			
CIDIIDE	and ar	e familiar with the possil			
tools to formati ped an acader	o locate ion retr unders mic con	e subject-specific facts in ieval tools as well as to u standing of the legal fram text and are able to use	bilities offered by elect a variety of resource use new web-based te nework surrounding p information responsil	ctronic publishing. s. Students are able echnologies to shar publications, inform bly.	They are able to use electronic
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## **Teaching cycle**

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

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# Module appears in

Bachelor' degree (1 major) Biochemistry (2011)

Bachelor' degree (1 major) Biochemistry (2013)

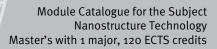
Bachelor' degree (1 major) Biochemistry (2009)

Master's degree (1 major) Nanostructure Technology (2011)

Master's degree (1 major) Nanostructure Technology (2010)

Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)





# **Thesis** (30 ECTS credits)

Module title					Abbreviation
Master Thesis Nanostructure Technology					11-MA-N-072-m01
Module coordinator				Module offered by	
chairperson of examination committee				Faculty of Physics and Astronomy	
ECTS Method of grading		Only after succ. compl. of module(s)			
30 numerical grade					
Duration Module level		Module level	Other prerequisites		
1 semester		graduate	Registration for assessment to be carried out electronically. Deadlines will be announced separately. Please consult with your supervisor.		
Contents					
Mostly independent processing of an experimental, theoretical or engineering task in the field of nanostructure technology, especially according to known procedures and scientific aspects; writing of the thesis.					
Intended learning outcomes					
The students are able to independently work on an experimental, theoretical and engineering task from nano- structure technology, especially in accordance with known methods and scientific aspects and to summarise their results in a final paper.					
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)					
no courses assigned					
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)					
written thesis (approx. 75 pages)					
Allocation of places					
Additional information					
Workload					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master's degree (1 major) Nanostructure Technology (2010)					