

Module Catalogue for the Subject

FOKUS Physics

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|e07|-|-|H|2010

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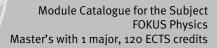
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data record Master (120 ECTS) FOKUS Physik - 2010				

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FOKUS Research Module Complex	-	347
	Semiconductor Physics and Devices	349
	Transport in Semiconductor Nanostructures	351
FOKUS Research Module Methods		353
	in Surface Spectroscopy with Mini Research Project	354
FOKUS Research Module High Ene		356
	rgy Astrophysics with Mini Research Project	358
FOKUS Research Module Spectros FOKUS Research Module Nano-Op		360
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FOKUS Research Module Density F	unctional Theory and the Physics of Oxide Heterostructure	387
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Thesis

Master Thesis FOKUS Physics

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The subject is divided into

section / sub-section	ECTS credits	starting page
Compulsory Courses	50	10
Compulsory Electives	40	17
Compulsory Electives Specialisation Physics	24	18
Applied Physics and Metrology	24	19
Solid State Physics and Nanostructures	24	65
Astrophysics and Particle Physics	24	137
Complex Systems, Quantum Control and Biophysics	24	191
Other Modules Specialisation	24	204
Compulsory Electives Research Modules Physics	16	225
Thesis	30	388

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Content and Objectives of the Programme

The FOKUS master study program is a special course, which provides on the one hand short time study (only 8 semesters in a consecutive Bachelor and Master program) and on the other hand puts significant emphasis on early integration of research activities. This Master study program is embedded an financed through the »Elitenetzwerk Bayern« (ENB). The master course is especially preparing the students for their later scientific work in the field of Physics. Qualified graduates may pursue doctoral work (degree Dr. rer. nat.) at doctorate-granting institutions. The goal of the studies is it to mediate special knowledge on the most important subsections of the experimental and theoretical physics and to make the students familiar with the methods of scientific and physical thinking and working. By training of analytic thinking abilities the students acquire the ability to deal later with the various fields of applications and to compile the special knowledge obtained within the Bachelor programme. During the Master thesis the student should independently work on a new thematic and temporally limited experimental or theoretical engineering-scientific task in the field of experimental or theoretical physics using well-known procedures and scientific criteria.

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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 (2010-61)

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

(50 ECTS credits)

Master's with 1 major FOKUS Physics (2010)
--

Module title			Abbreviation		
FOKUS Project Practical Course Physics 11-FPP-072-m01				11-FPP-072-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)	
10	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	lts				
		vork on a current researc eriments including analys			hysics and implementation of
Intende	ed learı	ning outcomes			
		are able to independently nalyse scientific experim			imental or Theoretical Physics, to
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
P (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available)
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
placement report / fieldwork report / report on practical training / report on practical course / project report / re- port on technical course (approx. 20 pages) and talk (approx. 30 minutes) on respective topic researched Language of assessment: German or English					
Allocation of places					
Additio	onal inf	ormation			
Worklo	ad				
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
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
Professional Specialization FOKUS Physics 11-FS-PF-072-m01					11-FS-PF-072-m01
Module coordinator Module offered			Module offered by	1	
chairp	erson o	f examination committee	!	Faculty of Physics a	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	i	
1 seme	ester	graduate			
Conter	nts				
					of Physics with special relevance tal topics in a seminar presentati
Intend	ed lear	ning outcomes			
a spec	ial relev		oic of the Master's the	esis. They know the o	subdiscipline of Physics with current state of research in this
Course	es (type, r	number of weekly contact hours,	anguage — if other than Ge	rman)	
S (no i	nforma	tion on SWS (weekly cont	tact hours) and cours	e language available	2)
		Sessment (type, scope, langua ile for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether
		ussion (approx. 30 to 45 ssessment: German or E			
	tion of				
Additio	onal inf	ormation			
Worklo	bad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	ammes)	
Modul	e appea	ars in			
Master	r's degr	ee (1 major) FOKUS Physi	cs (2010)		
Master's degree (1 major) FOKUS Physics (2011)					
Master	r's degr	ee (1 major) FOKUS Physi	cs (2006)		

Module title				Abbreviation		
Scienti	fic Met	hods and Project Manag	11-MP-PF-072-m01			
Module	e coord	inator		Module offered by		
chairpe	chairperson of examination committee			Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
15	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
					roject planning. Application to plan for the planned Master's	
Intende	ed leari	ning outcomes				
thods of topic of	of a cur f the Ma	rent experimental and the	eoretical subdisciplir ble to draft a project	e of Physics with sp plan for the Master's	ncluding project planning me- ecial relevance to the intended thesis and to plan the required presentations.	
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)		
R (no ir	nformat	ion on SWS (weekly cont	act hours) and cours	e language available)	
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
		ussion (approx. 30 to 45 r ssessment: German or Er				
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	ars in				
	0	ee (1 major) FOKUS Physi	· ,			
	-	ee (1 major) FOKUS Physi				
Master	's degr	ee (1 major) FOKUS Physi	cs (2006)			

Module	e title				Abbreviation
Advand	Advanced Seminar Experimental/Theoretical Physics				11-0SP-072-m01
Module	Module coordinator			Module offered by	
		ectors of the Institute of Theoretical Physics	e of Applied Physics and s and Astrophysics	Faculty of Physics	and Astronomy
ECTS	Meth	od of grading	Only after succ. con	ompl. of module(s)	
4	nume	rical grade			
Duratio	on	Module level	Other prerequisites	;	
1 seme	ster	graduate	/ / /		
Conten	ts		I.		
		urrent issues of Theo	retical or Experimental Pr	nysics.	
		ning outcomes		,	
are abl	e to ex				ental or Theoretical Physics. They this knowledge and present it to
Course	S (type, 1	number of weekly contact h	ours, language — if other than Ge	rman)	
S (no ir	nforma	tion on SWS (weekly	contact hours) and cours	e language availabl	e)
Metho	d of as	sessment (type, scope, l	anguage — if other than German,	examination offered — if n	ot every semester, information on whether
		ole for bonus)			
		ussion (approx. 30 to	o 45 minutes)		
Allocat	ion of	places			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regu	llations for teaching-degree progra	ammes)	
Module	e appea	ars in			
	-	ee (1 major) Physics			
Master	-	ee (1 major) Physics			
	'c doar		N ()		
Master	-	ee (1 major) FOKUS F ee (1 major) FOKUS F	Physics (2010)		

Module title					Abbreviation			
Advanc	ed Pra	ctical Course Master			11-PFM-072-m01			
Module	e 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	npl. of module(s)				
6	(not) s	successfully completed	11-E1, 11-E2					
Duratio	n	Module level	Other prerequisites					
1 seme	ster	graduate	11-A3					
Conten	ts							
stems, tic reso	proper nance	luclear, Atomic and Mo ties of solids, surfaces (NMR) - quantum Hall e ivity - laser - solid-state	and interfaces. Experine Effect - optical pumping	nents on the following	ng topics: X-rays - nu	clear magne-		
Intende	ed lear	ning outcomes						
suing s	cientifi	conducting experimen c publications, applica ring practical experime	tion of modern evaluat					
Course	S (type, r	number of weekly contact hour	s, language — if other than Ge	rman)				
man or	Englis chritte	nen-Praktikum Master			- /			
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether		
 This module has the following assessment components 1. Lab course in part 1 (Fortgeschrittenen-Praktikum Master/Advanced Practical Course Master Part 1): a) Preparing the experiment will be considered successfully completed if an oral test (approx. 30 minutes) is passed prior to the experiment. b) Performing and evaluating the experiment will be considered successfully completed if a test is passed. Students must prepare an experiment log (approx. 8 pages). 2. Lab course in part 2 (Fortgeschrittenen-Praktikum Master/Advanced Practical Course Master Part 2): a) Preparing the experiment will be considered successfully completed if an oral test (approx. 30 minutes) is passed prior to the experiment will be considered successfully completed if an oral test (approx. 30 minutes) is passed prior to the experiment will be considered successfully completed if an oral test (approx. 30 minutes) is passed prior to the experiment will be considered successfully completed if an oral test (approx. 30 minutes) is passed prior to the experiment. b) Performing and evaluating the experiment will be considered successfully completed if a test is passed. Students must prepare an experiment log (approx. 8 pages). Language of assessment: German or English 								
Studen pass ar To pass	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	ion of _l	olaces	_					
Additional information								
Worklo	ad							
			_					
Teachir	ıg cycl	e						
		_						
Master's wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e Naster (120 ECTS) FOKUS Phys	-	page 15 / 389		

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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 16 / 389
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Compulsory Electives

(40 ECTS credits)

The area of mandatory electives (40 ECTS credits) comprises: mandatory electives area SP ("Spezialausbildung Physik" ("Special Training Physics")): 24 ECTS credits. mandatory electives area FP ("Forschungsmodule Physik" ("Research Modules Physics")): 16 ECTS credits. 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). The Faculty will specify whether a specific module belongs to group "Theoretische Physik" ("Theoretical Physics") or group "Experimentelle Physik" ("Experimental Physics") (for the purpose of calculating the overall grade).



Compulsory Electives Specialisation Physics

(24 ECTS credits)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 18 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	



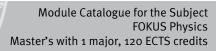
Applied Physics and Metrology

(24 ECTS credits)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 19 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation		
Opto-e	lectron	ic Material Properties			11-MOE-092-m01		
Madul	e coord	instar		Madula offered by	<u> </u>		
			Angelie d Dhusies	Module offered by Faculty of Physics and Astronomy			
	1	ector of the Institute of			ind Astronomy		
ECTS		od of grading	Only after succ. con	ipl. of module(s)			
5		rical grade					
Duratio	on	Module level	Other prerequisites				
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 admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification			
Conten	te			essment anew.			
		inles of ontooloctronic	material properties and	dapplications			
	· ·		material properties and	a applications.			
Intended learning outcomes The students know the principles of optoelectronic material characteristics.							
		· · ·					
	-		rs, language — if other than Ger				
V + Ü (I	no infoi	mation on SWS (week	ly contact hours) and co	ourse language avail	able)		
		essment (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 le to complete: 1 to 4 we	n less than 4 ECTS cr	edits approx. 20 mi	nutes) or c)	
Allocat							
Additio	nal inf	ormation					
Worklo	bad						
WOIKIO	au						
reachi	ng cycl	e					
Referre	ed to in	LPO I (examination regulat	ions for teaching-degree progra	mmes)			
Module	e appea	ars in					
Master Master Master	's degr 's degr 's degr	ee (1 major) Technolog	010) y of Functional Materia y of Functional Material				
	-		ture Technology (2010) ysics - Nanostructuring	Technology (2010)			
	-	FOKUS Physics (2010)		• generated 26-Aug-2024 • 6	ayam reg	page 20 / 389	
musici S W	in i maju	- 5K05 + Hysics (2010)	-	laster (120 ECTS) FOKUS Phys	-	pase 20 / 309	



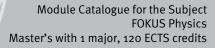


Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) Functional Materials (2012)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 21 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	Module title				Abbreviation	
Organi	Organic Semiconductor 11-OHL-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 Method of grading			Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	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 obta over the course of th assessment into eff mitted to assessme assessment at a lat	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 semic	onductors, molecular a	nd polymer electroni	cs and sensor techn	ology, appli-
Intende	ed lear	ning outcomes				
			edge of organic semicor	iductors.		
			rs, language — if other than Ge			
V + Ü (r	no infoi	rmation on SWS (week	ly contact hours) and co	ourse language avail	able)	
		sessment (type, scope, lan 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 didate, for modules with e to complete: 1 to 4 we	h less than 4 ECTS cr	edits approx. 20 mir	nutes) or c)
Allocat	ion of _l	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
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) Master's with 1 major FOKUS Physics (2010) Master's with 1 major FOKUS Physics (2010)						
			data record N	Aaster (120 ECTS) FOKUS Phys	ik - 2010	

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 A			Abbreviation		
Electronics 11-A2-081-m01			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	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Content	ts				
Principl technol		bassive and active electro	nic components and	their application in a	analogous and digital circuit
Intende	ed leari	ning outcomes			
The stu circuit t			actical setup of elect	ronic circuits from th	ne field of analogous and digital
Courses	5 (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)	
V + Ü (n	io infor	rmation on SWS (weekly o	contact hours) and co	ourse language availa	able)
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written	examiı	nation (approx. 90 minut	es)		
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachin	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	ars in			
Bachelo	or' deg	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 Physi gree (1 major, 1 minor) Ph			
		ination Special study offe			

Module	e title			Abbreviation			
Reprod	ducing S	Sensors in Infrared			11-ASI-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)			
3	nume	rical grade					
Duratio	on	Module level	Other prerequisites	i			
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	nts						
range of up to n from be sical of types of of neur	of infrar nicrowa odies w ptics of of senso rophysi ed lear	ed ranges from the vis ves and radiowaves w ith ambient temperatu this spectral range an ors (bolometer, quantu ological aspects. hing outcomes	rimental and technical ible spectrum, where th ith artificial emitters. Th ire in the infrared spect d discusses: Peculiariti m well, superlattice) as	ne Sun is dominating nere is distinct and s rum. The lecture prov es of infrared camera well as the evaluation	as the natural source ometimes dominatir vides an introduction as and thermal imag on of such sensors o	ce of light, ng emission n to the phy- res, different on the basis	
techno	logies a	and detector structures	s as well as their applic	ation areas.			
		•	rs, language — if other than Ge		11.		
			y contact hours) and co				
		s essment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informat	ion on whether	
groups project (appro. Assess and wi examir Langua Allocat Additic	s (appro t report x. 30 m sment o Il be an hation r age of a tion of p	x. 30 minutes per cand (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 didate, for modules with to time to complete: 1 to often assessment will l under observance of Sec nglish	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends c	edits approx. 20 mir entation/seminar pre on the method of ass	nutes) or c) esentation sessment	
Worklo	Workload						
Teachi	ng cycl	9					
Master's w	vith 1 major	FOKUS Physics (2010)		; • generated 26-Aug-2024 • e Master (120 ECTS) FOKUS Phys		page 25 / 389	

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)

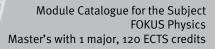
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)

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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 26 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation			Abbreviation					
Applied Superconduction				11-ASL-092-m01				
Module coordinator				Module offered by				
Managing Director of the Institute of Ap			Applied Physics	oplied Physics Faculty of Physics and Astronomy				
ECTS Method of grading		Only after succ. con	npl. of module(s)					
6 numerical grade								
Duratio	on	Module level	Other prerequisites	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	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							
			vity. Application in ene alculation of temperatu			ents. Me-		
Intende	ed lear	ning outcomes						
are able able to energy Course R + V (n Methoo module is a) writte in grou c) proje prox. 30 Assess	Intended learning outcomes The students have a basic understanding of superconductivity as a macroscopic quantum phenomenon. They are able to evaluate the contributions of materials sciences to the development of superconductivity. They are able to discuss questions on superconductivity in a scientific manner and to critically question developments of energy technology. Furthermore, they can deal with practical mathematical questions. 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 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presentation (approx. 30 minutes)					y. They are elopments of ion on whether amination ninutes) or		
	<u> </u>	ssessment: German, E	nglish					
Allocat	ion of p	olaces						
Additio	nal inf	ormation						
 World -								
Worklo	au							
 Toachir		•						
Teachiı	ig cyci	8						
 Doforro	d to in		ions for teaching-degree progra	ummac)				
		LFOI (examination regulat		anines)				
Module	annes	ins in						
		ree (1 major) Physics (2	2010)					
		FOKUS Physics (2010)	-	• generated 26-Aug-2024 • 6	ayam reg	nage 27 / 200		
master S WI	ian i majo	10/00 1 Hysics (2010)	-	aster (120 ECTS) FOKUS Phys	-	page 27 / 389		

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)

Master's with 1 major FOKUS Physics (2010)

Module title Abbreviation				Abbreviation	
Principles of Image Processing				11-EBV-092-m01	
Module coord	inator		Module offered by		
Managing Director of the Institute of Ap		oplied Physics	Faculty of Physics and Astronomy		
ECTS Method of grading		Only after succ. com	pl. of module(s)		
3 nume	numerical grade				
Duration	Module level	Other prerequisites			
1 semester undergraduate Certain prerequisites must be met to qualify sessment. The lecturer will inform students a at the beginning of the course. Registration f sidered a declaration of will to seek admission dents have obtained the qualification for admitted to assessment into effect. Students who meet all ted to assessment in the current or in the subsessment at a later date, students will have ta 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- t all prerequisites will be admit- e subsequent semester. For as-			
Contents	1				
transform. His tic image reco tracking). Thre	stogram equalisation (e.g gnition: Segmentation, c ee-dimensional images.	. image brightening)	and pixel connectivit	ation. Two-dimensional Fourier ty (e.g. noise reduction). Automa- tion. Applications (e.g. motion	
	ning outcomes		<u></u>		
and theory of le to independ	signal processing for ima dently work with literature	ges and have corresp e, they understand th	oonding knowledge o e characteristics of i	ssing. They know the principles of image generation. They are ab- mage processing with commerci- imaging measuring methods.	
Courses (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
V + R (no info	rmation on SWS (weekly o	contact hours) and co	urse language availa	able)	
Method of ass module is creditat		ge — if other than German, e	examination offered — if no	t every semester, information on whether	
groups (appro project report (approx. 30 m Assessment o and will be an examination r	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.				
	ssessment: German, Eng	lish			
Allocation of	places				
Additional inf	Additional information				
Workload					
 Teaching cycl	0				
	C				
L					

JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Master (120 ECTS) FOKUS Physik - 2010

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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)

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 with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 30 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	Module title Abbreviation				Abbreviation
Principles of Energy Technologies 11-ENT-092-m01				11-ENT-092-m01	
Module	e coord	inator		Module offered by	
Managing Director of the Institute of Ap		pplied Physics Faculty of Physics and Astronomy			
ECTS Method of grading		Only after succ. com	npl. of module(s)		
6 numerical grade					
Duratio	n	Module level	Other prerequisites		
ses at i sid der the ses tec ses		sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se 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				
as rene ting ma studen verters Electric	wable aterials ts. Ene . Nucle ity. Bio	resources of energy. We , selective layers, highly rgy conservation via ther	also discuss aspects activated carbons). The mal insulation. Therm ectricity. Wind turbing	of optimising materi he course is especia nodynamic energy ef es. Photovoltaics. So	port and energy storage as well fals (e.g. nanostructured insula- lly suitable for teaching degree ficiency. Fossil fired energy con- olar thermal: Heat. Solar thermal:
			ferent methods of en	erav technology es	pecially energy conversion, trans-
port an	d stora	ge. They understand the	structures of corresp	onding installations	and are able to compare them.
		number of weekly contact hours, l			
		mation on SWS (weekly o			
		sessment (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 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			-		
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	е			

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

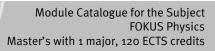
Module appears in

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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 32 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation
Introdu	iction t	o Plasmaphysics			11-EPP-092-m01
Module coordinator				Module offered by	1
	ing Dire	ector of the Institute of	Theoretical Physics	Faculty of Physics a	and Astronomy
ECTS Method of grading Only after succ. compl. of module(s) 6 numerical grade		pl. of module(s)			
Duratio	on	Module level	Other prerequisites		
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Conten	ts	<u> </u>			
Transpo thin the celerat Intende	ort equ e solar ion anc ed lear idents	ations for energetic pa wind, Particle accelera I transport in galaxies ning outcomes know the principles of	rticles, Properties of ma tion via shock waves an and other astrophysical Plasma Physics, especi	agnetic turbulence, F nd via interaction wi l objects, Cosmic rac ally the description	of transport phenomena in plas-
ma. Th	ey are a	able to solve basic prol	olems of Plasma Physic	s and to apply this k	knowledge to Astrophysics.
	-		rs, language — if other than Ger		
			y contact hours) and co		
		sessment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	ot every semester, information on whether
groups project (approz Assess and wil examin	(appro report x. 30 m ment o Il be an nation r	x. 30 minutes per cano (approx. 8 to 10 pages inutes) ffered: When and how	lidate, for modules with , time to complete: 1 to often assessment will h inder 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	ion of _l	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)	
Mactoricui	ith 1 maio	r FOKUS Physics (2010)	IMIL Würzburg	• generated 26-Aug-2024 •	exam. reg. page 33 / 389





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)
Master's degree (1 major) FOKUS Physics (2011)
Master's degree (1 major) Computational Mathematics (2012)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 34 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

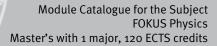
Module title					Abbreviation
Semiconductor Lasers - Principles and Current Research11-HLF-092				11-HLF-092-m01	
Module coordinator				Module offered by	
Managing Director of the Institute of Applied Physics		oplied Physics	Faculty of Physics and Astronomy		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
6	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 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			
rent de model, hold co	cture di evelopn , which onditioi	nents regarding compone will then be extended to n, characteristic curve an	nts. The principles of special aspects of se d laser efficiency are	f lasers are describe miconductor lasers. derived from couple	semiconductor lasers, and cur- d on the basis of a general laser Basic concepts such as thres-
des, la ductor	ser reso lasers.	onators, mode selection, The lecture closes with c	dynamic properties a urrent topics of laser	as well as technolog	luctors, layer and ridge wavegui- y for the generation of semicon- uantum dot lasers, quantum cas-
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Teaching cycle

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 title				Abbreviation		
Princip	Principles of Classification of Patterns				11-KVM-092-m01	
Module	e coord	inator		Module offered by		
Managi	ing Dire	ector of the Institute of	Applied Physics	plied Physics Faculty of Physics and Astronomy		
ECTS Method of grading			Only after succ. con	npl. of module(s)		
3	nume	rical grade				
Duratio	n	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 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					
terns. T More a	⁻ hese p nd mor	as images, but also acc atterns are often class e automatic procedure ples of different classif	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.
Intende	ed lear	ning outcomes				
classify	/ing pa	have specific and adva tterns in measuring dat s to practical problems	ta as well as ways to au			
		umber of weekly contact hour				
V + R (n	no infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
(approx report (30 min	k. 30 m (approx utes)	mination (90 minutes) inutes per candidate, f c. 8 to 10 pages, time to ffered: When and how	or modules with less th complete: 1 to 4 week	nan 4 ECTS credits ap s) or d) presentation	oprox. 20 minutes) o /seminar presentati	r c) project on (approx.
examin	ation r	nounced in due form u egulations) 2009. ssessment: German, E		ction 32 Subsection	3 ASPO (general aca	demic and
Allocat	-					
Additional information						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Master's wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • 6 Aaster (120 ECTS) FOKUS Phys	-	page 37 / 389



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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 38 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module titl	9			Abbreviation	
Introductio	n to LabVIEW			11-LVW-092-m01	
Module coordinator			Module offered by		
Managing [)irector of the Institute	of Applied Physics	Faculty of Physics	and Astronomy	
ECTS Me	thod of grading	Only after succ. cor	npl. of module(s)		
6 nur	nerical grade				
Duration	Module level	Other prerequisites	i		
sessment. The lecturer will inform students about the respective at the beginning of the course. Registration for the course will b sidered a declaration of will to seek admission to assessment. I dents have obtained the qualification for admission to assessm the course of the semester, the lecturer will put their registratio sessment into effect. Students who meet all prerequisites will b ted to assessment in the current or in the subsequent semester sessment at a later date, students will have to obtain the qualifi admission to assessment anew.			ation for the course will be con- mission to assessment. If stu- for admission to assessment over r will put their registration for as- tet all prerequisites will be admit- he subsequent semester. For as-		
Contents					
on fields of the development environment of LabVIEW. The students become acquainted with dataflow program- ming and with common LabVIEW architectures. They learn to develop LabVIEW applications for various applicati- on fields, from assessment and measurement applications up to data collection, device control, data recording and measurement analysis. In the advanced course "NI LabVIEW Core 2", the students learn to develop compre- hensive standalone applications, including the graphical development environment LabVIEW. The course builds upon LabVIEW Basic 1 and provides an introduction to the most common development technologies, in order to enable the students to successfully implement and distribute LabVIEW applications for different application fields. Course topics include techniques and procedures for the optimisation of application performance, e.g. through an optimised reuse of existing codes, usage of file I/O functions, principles of data management, event computing and methods of error handling. After finishing the course, the students have the ability to apply Lab- VIEW functions according to individual requirements, which enables a fast and productive application develop-					
ment. Intended le	arning outcomes				
	•	-		f LabVIEW. They know the princip- rding and analysing measuring da	
Courses (type, number of weekly contact hours, language — if other than German)					
V + Ü (no information on SWS (weekly contact hours) and course language available)					
		anguage — if other than German,	examination offered — if	not 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					

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

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Master's with 1 major FOKUS Physics (2010)



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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 40 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Thermo	Module title				Abbreviation
	odynar	nics and Economics			11-TDO-092-m01
Module coordinator				Module offered by	
Managing Director of the Institute of Theoretical Physi and Astrophysics			f Theoretical Physics	Faculty of Physics a	and Astronomy
ECTS	1	od of grading	Only after succ. con	npl. 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 technological and ecological boundaries of industrial economic growth. Part 2 analyses how the factors capital, work, energy and creativity produce the goods and services of a national economy and determine economic growth. The productive power of cheap energy by far exceeds that of expensive labour. Within the current system of taxes and social security contributions, this discrepancy between power and costs of production factors leads to job cuts, waste of resources, impoverishment of nations and growing social tensions. The course discusses how factor income taxation can counteract this development. Part 3 includes seminar presentations, comprises the techniques of rational energy use and non-fossil energy use, and introduces the optimisation programme deeco (Dynamic Energy, Emission and Cost Optimization).					
nomic system tors lea discus compri	growth n of tax ads to j ses hov ises the	. The productive powe es and social security ob cuts, waste of reso w factor income taxation e techniques of rationa	r of cheap energy by far contributions, this discr urces, impoverishment on can counteract this d al energy use and non-fc	services of a nationa exceeds that of expe epancy between pow of nations and growi evelopment. Part 3 i ossil energy use, and	al economy and determine eco- ensive labour. Within the current wer and costs of production fac- ing social tensions. The course ncludes seminar presentations,
nomic system tors lea discus compri gramm	growth n of taxe ads to j ses how ises the ne deec	. The productive powe es and social security ob cuts, waste of reso w factor income taxation e techniques of rationa	r of cheap energy by far contributions, this discr urces, impoverishment on can counteract this d al energy use and non-fc	services of a nationa exceeds that of expe epancy between pow of nations and growi evelopment. Part 3 i ossil energy use, and	al economy and determine eco- ensive labour. Within the current wer and costs of production fac- ing social tensions. The course ncludes seminar presentations,
nomic system tors lea discuss compri gramm Intende The stu in the v connec mies. T NOTE:	growth n of tax ads to j ses hou ises the deec ed lear udents world's ctions b They an this is	The productive powe es and social security ob cuts, waste of reso w factor income taxatic e techniques of rationa o (Dynamic Energy, En ning outcomes understand that energy economic and social petween thermodynam e able to apply the acc the module that was ru	er of cheap energy by far contributions, this discr urces, impoverishment on can counteract this d al energy use and non-for nission and Cost Optimi gy conversion and entrop development. As an exten nics and economy as we quired knowledge to par	services of a national exceeds that of experience epancy between power of nations and growin evelopment. Part 3 in possil energy use, and zation). by production are go ension of economic to a s the productive	al economy and determine eco- ensive labour. Within the current wer and costs of production fac- ing social tensions. The course ncludes seminar presentations, introduces the optimisation pro- ing to play an important role theory, the students know the obysical basis of modern econo- ed. As the module was tailored to
nomic system tors lea discuss compri gramm Intenda The stu in the v connec mies. T NOTE: his own	growth n of tax ads to j ses hou ises the ne deec ed lear udents world's ctions to They and this is n n theor	The productive powe es and social security ob cuts, waste of reso w factor income taxatic e techniques of rationa o (Dynamic Energy, En ning outcomes understand that energy economic and social between thermodyname e able to apply the acc the module that was ru y of economy, it has yo	r of cheap energy by far contributions, this discr urces, impoverishment on can counteract this d al energy use and non-for nission and Cost Optimi gy conversion and entrop development. As an exten nics and economy as we quired knowledge to par un by Prof. Dr. R. Kümme	services of a national exceeds that of experience of nations and growin evelopment. Part 3 in ossil energy use, and zation).	al economy and determine eco- ensive labour. Within the current wer and costs of production fac- ing social tensions. The course ncludes seminar presentations, introduces the optimisation pro- ing to play an important role theory, the students know the obysical basis of modern econo- ed. As the module was tailored to
nomic system tors lea discuss compri gramm Intende The stu in the v connec mies. T NOTE: his own	growth n of tax ads to j ses hou ises the deec ed lear udents world's ctions b They an this is n theor	The productive power es and social security ob cuts, waste of reso w factor income taxation te techniques of rational o (Dynamic Energy, En ming outcomes understand that energy economic and social between thermodynam e able to apply the acc the module that was ru y of economy, it has you	er of cheap energy by far contributions, this discr ources, impoverishment on can counteract this d al energy use and non-for nission and Cost Optimi gy conversion and entrop development. As an exten nics and economy as we quired knowledge to par un by Prof. Dr. R. Kümme et to be decided whethe	services of a national exceeds that of experience of nations and growin evelopment. Part 3 in ossil energy use, and zation).	al economy and determine eco- ensive labour. Within the current wer and costs of production fac- ing social tensions. The course ncludes seminar presentations, introduces the optimisation pro- ing to play an important role theory, the students know the ohysical basis of modern econo- ed. As the module was tailored to offer this module.
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nomic system tors lea discuss compri gramm Intende The stu in the v connec mies. T NOTE: his own Course R + V (r Methou a) writt groups project (appro Assess and wi examir	growth n of tax ads to j ses hov ises the ne deecc ed lear udents world's ctions b They art this is n theor es (type, no info d of as is credital ten exa s (approt t report x. 30 m sment c ill be ar nation n	. The productive powe es and social security ob cuts, waste of reso w factor income taxatic e techniques of rationa o (Dynamic Energy, En ning outcomes understand that energy economic and social of between thermodynam e able to apply the acc the module that was ru y of economy, it has you number of weekly contact hou rmation on SWS (week sessment (type, scope, lar ole for bonus) mination (approx. 90 for cox. 30 minutes per can c (approx. 8 to 10 pages ninutes) offered: When and how	er of cheap energy by far contributions, this discr ources, impoverishment on can counteract this d al energy use and non-for nission and Cost Optimi gy conversion and entrop development. As an extention development. As an extention dured knowledge to par un by Prof. Dr. R. Kümme et to be decided whethe urs, language — if other than Ger (ly contact hours) and con nguage — if other than German, minutes) or b) oral exam ididate, for modules with s, time to complete: 1 to w often assessment will I under observance of Sec	services of a national exceeds that of experience of nations and growin evelopment. Part 3 i possil energy use, and zation). by production are go ension of economic to a sthe productive p ticular problems. el, who has now retire or we will continue to rman) purse language avail examination offered — if no ination of one candin h less than 4 ECTS cro- 4 weeks) or d) preserved be offered depends of	al economy and determine eco- ensive labour. Within the current wer and costs of production fac- ing social tensions. The course ncludes seminar presentations, introduces the optimisation pro ing to play an important role theory, the students know the ohysical basis of modern econo- ed. As the module was tailored to offer this module.
nomic system tors lea discuss compri gramm Intende The stu in the v connec mies. T NOTE: his own Course R + V (r Methou a) writt groups project (appro Assess and wi examir	growth n of tax ads to j ses hov ises the ne deecc ed lear udents world's ctions b They art this is n theor es (type, no info d of as is credital ten exa s (approt t report x. 30 m sment c ill be ar nation n	. The productive powe es and social security ob cuts, waste of reso w factor income taxatic e techniques of rational o (Dynamic Energy, En ning outcomes understand that energy economic and social of between thermodynam e able to apply the acc the module that was ru y of economy, it has yu number of weekly contact hou rmation on SWS (week sessment (type, scope, lar ole for bonus) mination (approx. 9 of box. 30 minutes per can c (approx. 8 to 10 pages ninutes) offered: When and how mounced in due form regulations) 2009.	er of cheap energy by far contributions, this discr ources, impoverishment on can counteract this d al energy use and non-for nission and Cost Optimi gy conversion and entrop development. As an extention development. As an extention dured knowledge to par un by Prof. Dr. R. Kümme et to be decided whethe urs, language — if other than Ger (ly contact hours) and con nguage — if other than German, minutes) or b) oral exam ididate, for modules with s, time to complete: 1 to w often assessment will I under observance of Sec	services of a national exceeds that of experience of nations and growin evelopment. Part 3 i possil energy use, and zation). by production are go ension of economic to a sthe productive p ticular problems. el, who has now retire or we will continue to rman) purse language avail examination offered — if no ination of one candin h less than 4 ECTS cro- 4 weeks) or d) preserved be offered depends of	al economy and determine eco- ensive labour. Within the current wer and costs of production fac- ing social tensions. The course ncludes seminar presentations, introduces the optimisation pro- ing to play an important role theory, the students know the ohysical basis of modern econo- ed. As the module was tailored to offer this module. able) at 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

Allocation of places

Additional information

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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 (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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 42 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation		
Current Topics in Experimental Physics					11-EXE5-111-m01	
Module	Module coordinator			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)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate	Approval by examina	ation committee req	uired.	
Conten	ts					
Current or stud			Accredited academi	c achievements, e.g.	in case of change of university	
Intende	ed leari	ning outcomes				
sics of derstar	the Ma nd the r	ster's programme. They h	nave knowledge of a c tion methods necess	current subdiscipline ary to acquire this ki	of a module of Experimental Phy- e of Experimental Physics and un- nowledge. They are able to classi-	
Course	S (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 avail	able)	
		e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
less oth minute: prox. 8 tes)	nerwise s per ca to 10 p	e specified) or b) oral exa andidate, for modules wi	mination of one cand th less than 4 ECTS cr 1 to 4 weeks) or d) pre	idate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- camination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-	
Allocat						
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master	Master's degree (1 major) Physics (2010)					
	Master's degree (1 major) Physics (2011)					
	-	ee (1 major) FOKUS Physi				
	-	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi				
Master's degree (1 major) FOKUS Physics (2006)						

Module title				Abbreviation	
Current Topics in Experimental Physics					11-EXE6-111-m01
Module	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)	
6	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate	Approval by examination	ation committee req	uired.
Conten	ts				
Current or study			Accredited academic	c achievements, e.g.	in case of change of university
Intende	ed learr	ning outcomes			
sics of t derstan	the Ma id the r	ster's programme. They h	ave knowledge of a c tion methods necess	current subdiscipline ary to acquire this kr	of a module of Experimental Phy- e of Experimental Physics and un- nowledge. They are able to classi-
Course	S (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)
		essment (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)	nerwise s per ca to 10 p	specified) or b) oral exa andidate, for modules wi	mination of one cand th less than 4 ECTS cr 1 to 4 weeks) or d) pre	idate each or oral ex redits approx. 20 min	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachir	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) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2006)					

Module title				Abbreviation	
Current Topics in Experimental Physics					11-EXE7-111-m01
Module	coord	inator		Module offered by	
chairpe	rson of	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 examina	ation committee req	uired.
Conten	ts				
Current or stud			Accredited academi	c achievements, e.g.	. in case of change of university
Intende	ed learr	ning outcomes			
sics of t derstan fy the s	the Ma Id the r ubject-	ster's programme. They h neasuring and/or evalua specific contexts and kno	ave knowledge of a c tion methods necess ow the application ar	current subdiscipline ary to acquire this kr eas.	of a module of Experimental Phy- e of Experimental Physics and un- nowledge. They are able to classi-
		umber of weekly contact hours, l mation on SWS (weekly o			abla)
		•			
		le for bonus)	ge — If other than German, e	examination offered — if no	t every semester, information on whether
less oth minute: prox. 8 tes)	nerwise s per ca to 10 p	e specified) or b) oral exa andidate, for modules wi	mination of one cand th less than 4 ECTS cr 1 to 4 weeks) or d) pre	idate 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-
Allocat					
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module appears in					
Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) 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		
Current Topics in Experimental Physics					11-EXE8-111-m01	
Module	coord	inator		Module offered by		
chairpe	erson of	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 examina	ation committee req	uired.	
Conten	ts					
Current or stud			Accredited academic	c achievements, e.g.	in case of change of university	
Intende	ed learr	ning outcomes				
sics of derstar	the Ma nd the r	ster's programme. They h	ave knowledge of a c tion methods necess	current subdiscipline ary to acquire this kr	of a module of Experimental Phy- of Experimental Physics and un- nowledge. They are able to classi-	
Course	S (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)	
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
less oth minute: prox. 8 tes)	nerwise s per ca to 10 p	e specified) or b) oral exa andidate, for modules wi	mination of one cand th less than 4 ECTS cr 1 to 4 weeks) or d) pre	idate each or oral ex redits approx. 20 min	credits approx. 90 minutes; un- camination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-	
Allocat						
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ng cycl	9				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module appears in						
	Master's degree (1 major) Physics (2010)					
	Master's degree (1 major) Physics (2011)					
	-	ee (1 major) FOKUS Physi				
	-	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi				
Master's degree (1 major) FOKUS Physics (2006)						

Module title				Abbreviation		
Current Topics in Theoretical Physics					11-EXT5-111-m01	
Module	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)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate	Approval by examination	ation committee req	uired.	
Conten	ts					
Current study a	•	of Theoretical Physics. A	ccredited academic a	achievements, e.g. ir	n case of change of university or	
Intende	ed learr	ning outcomes				
sics of sics and	the Ma d have	ster's programme. They h	ave advanced specia	alist knowledge of a	of a module of Theoretical Phy- subdiscipline of Theoretical Phy- ed methods to current problems	
		umber of weekly contact hours, l				
		mation on SWS (weekly o	-		·	
		e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
less oth minute prox. 8 tes)	nerwise s per ca to 10 p	e specified) or b) oral exa andidate, for modules wi	mination of one cand th less than 4 ECTS cr 1 to 4 weeks) or d) pre	idate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- camination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
Teachir	ng cycl	9				
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)					
	-	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi				
	-					
Master's degree (1 major) FOKUS Physics (2006)						

Module title				Abbreviation	
Current Topics in Theoretical Physics					11-EXT6-111-m01
Module	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)	
6	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate	Approval by examina	ation committee req	uired.
Conten	ts			· · · · ·	
Current study a		of Theoretical Physics. A	ccredited academic a	achievements, e.g. ir	n case of change of university or
Intende	ed learı	ning outcomes			
sics of sics an	the Ma d have	ster's programme. They h	ave advanced specia	alist knowledge of a	of a module of Theoretical Phy- subdiscipline of Theoretical Phy- red methods to current problems
Course	S (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)
		s essment (type, scope, langua) le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
less oth minute: prox. 8 tes)	nerwise s per ca to 10 p	e specified) or b) oral exa andidate, for modules wit	mination of one cand th less than 4 ECTS cr 1 to 4 weeks) or d) pre	idate each or oral ex redits approx. 20 min	credits approx. 90 minutes; un- kamination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	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) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2006)					

Module	e title				Abbreviation	
Current Topics in Theoretical Physics			11-EXT7-111-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)		
7	nume	rical grade				
Duratio	n	Module level	l Other prerequisites			
1 seme	ster	graduate	Approval by examination	ation committee req	uired.	
Conten	ts					
Current study a		of Theoretical Physics. A	ccredited academic a	achievements, e.g. ir	n case of change of university or	
Intende	ed leari	ning outcomes				
sics of t sics and of Theo	the Ma d have retical	ster's programme. They h mastered the required m Physics.	ave advanced specia ethods. They are able	alist knowledge of a e to apply the acquir	of a module of Theoretical Phy- subdiscipline of Theoretical Phy- red methods to current problems	
		umber of weekly contact hours, l				
		mation on SWS (weekly o				
		s essment (type, scope, langua; le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
less oth minute: prox. 8 tes)	nerwise s per ca to 10 p	e specified) or b) oral exa andidate, for modules wit	mination of one cand th less than 4 ECTS cr 1 to 4 weeks) or d) pro	idate 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-	
Allocat						
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	е				
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
Module	e appea	irs in				
	-	ee (1 major) Physics (2010				
	-	ee (1 major) Physics (2013				
	-	ee (1 major) FOKUS Physice ee (1 major) FOKUS Physic				
	-	ee (1 major) FOKUS Physic				
master	5 4051					

Module	title				Abbreviation	
Current Topics in Theoretical Physics 11-EXT8-111-mo1			11-EXT8-111-m01			
Module	e coord	inator		Module offered by		
chairpe	erson of	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.	
Contents						
Current study a	•	of Theoretical Physics. A	ccredited academic a	achievements, e.g. ir	n case of change of university or	
Intende	ed learr	ning outcomes				
sics of t sics and	the Ma d have	ster's programme. They h	ave advanced specia	alist knowledge of a	of a module of Theoretical Phy- subdiscipline of Theoretical Phy- red methods to current problems	
Course	S (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)	
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
less oth minute: prox. 8 tes)	nerwise s per ca to 10 p	e specified) or b) oral exa andidate, for modules wi	mination of one cand th less than 4 ECTS cr 1 to 4 weeks) or d) pre	idate each or oral ex redits approx. 20 mi	credits approx. 90 minutes; un- camination in groups (approx. 30 nutes) or c) project report (ap- presentation (approx. 30 minu-	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	e appea	in				
	-	ee (1 major) Physics (201				
	-	ee (1 major) Physics (201				
	-	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi				
	-					
musici	Master's degree (1 major) FOKUS Physics (2006)					

Module	e title				Abbreviation
Ultrafa	st Spe	ctroscopy and Quantur	n Control		08-PCM4-PHY-111-m01
Module	e coord	inator		Module offered by	
lecturer of the seminar "Ultrakurzzeitspektroskopie and Quantenkontrolle"			tspektroskopie and	Institute of Physica	ll and Theoretical Chemistry
ECTS Method of grading Only after succ. compl. of module(s)					
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites	5	
1 seme	ster	graduate			
Conten	ts				
			pics in ultrafast spectro ectroscopy and coherer		control. It focuses on ultrashort
Intend	ed lear	ning outcomes			
plain th	ne theo		er spectroscopy and na		naracterise them. They can ex- ethods. They can describe the
Course	S (type, r	number of weekly contact hour	rs, language — if other than Ge	erman)	
S + Ü (r	no info	mation on SWS (week	y contact hours) and c	ourse language avai	lable)
		s essment (type, scope, lang Ile for bonus)	guage — if other than German,	examination offered — if no	ot every semester, information on whether
		nation (90 minutes) or ssessment: German or		e candidate each (20	o minutes) or talk (30 minutes)
Allocat	ion of _l	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cvcl	e			
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)	
			0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Module	appea	ars in			
		ee (1 major) Physics (2)	010)		
	-	ee (1 major) Physics (2			
	-	ee (1 major) Nanostruc			
	-		ture Technology (2010)		
Master	's degr	ee (1 major) FOKUS Phy	/sics (2010)		
Master	's degr	ee (1 major) FOKUS Phy	/sics (2011)		

Module	e title				Abbreviation	
Princip	les of t	wo- and threedimensior	nal Röntgen imaging		11-ZDR-111-m01	
Module	e coord	inator		Module offered by	<u> </u>	
		ector of the Institute of A	pplied Physics	Faculty of Physics and Astronomy		
		Only after succ. con		,		
6		rical grade				
Duratio		Module level	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.				
Conten	ts					
project traction characc Intende The stu technic Course V + R (r Methoo module is a) writt groups project	ion, Fo n, visua terisati ed learn idents l ques us s (type, r no infor d of ass s creditab ren exan (appro report	n, scattering), physics of urier reconstruction, iter ilisation,). Application on, metrology, biology, . ning outcomes know the principles of ge ing X-rays and methods umber of weekly contact hours, mation on SWS (weekly sessment (type, scope, langu- le for bonus) mination (approx. 90 min x. 30 minutes per candid (approx. 8 to 10 pages, 1	ative methods). Image is of X-ray imaging in t). Radiation protection enerating X-rays and co of image processing a language — if other than Ger contact hours) and co age — if other than German, of nutes) or b) oral exam date, for modules with	e processing (image the industrial sector on and biological rac of their interactions v as well as applicatio (man) ourse language avail examination offered — if no ination of one candi n less than 4 ECTS cr	data pre-processing (component testing diation effect (dose, with matter. They kn n areas of these me able) ot every semester, informa date each or oral ex redits approx. 20 mi	g, feature ex- g, material ,). now imaging ethods. ution on whether kamination in inutes) or c)
Assess and wi	ll be an	inutes) ffered: When and how o nounced in due form un egulations) 2009.				
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	mmes)		
Aastor's w	ith 1 maio	r FOKUS Physics (2010)	1011 10/01250	• generated 26-Aug-2024 • 0	exam reg	page 52 / 389
nasiel S W	ian i majo	1 51(05 1 11/51(5 (2010)		aster (120 ECTS) FOKUS Phys		puge 52 / 309

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) FURUS Physics (2012) Master's degree (1 major) FOKUS Physics (2006)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 53 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

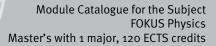
Module title				Abbreviation		
Thermo	dynam	ics and Economics			11-TDOE-141-m01	
Module	coord	inator		Module offered by		
Managi and Ast		ector of the Institute of Th iics	eoretical Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. compl. of module(s)			
3	(not) s	successfully 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 Intende The stu in the w connec mies. TI NOTE: t	escribe of civil econd oductio wth. nalyse ny and ur. With 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 hing outcomes understand that energy co economic and social dev etween thermodynamics able to apply the acquir	ersion in the develop luction density of nor or ecological damage define the technolog , work, energy and cre wth. The productive p taxes and social sec o job cuts, waste of re w factor income taxat comprises the techn rogramme deeco (Dy onversion and entrop elopment. As an exte 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 ener- namic Energy, Emiss oy production are goi ension of economic t l as the productive p cicular problems. l, 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	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (no in	Iformat	ion on SWS (weekly cont	act hours) and cours	e language available)	
		essment (type, scope, langua) le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
in grou	ps (app		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					
Teachir	ng cycl	9				
Referre	d to in	LPO I (examination regulations	for teaching-degree progra	mmes)		

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 54 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

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 with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 55 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

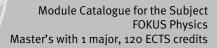
Module title					Abbreviation			
Image	and Sig	gnal Processing in Phy	sics		11-BSV-122-m01			
Module	e coord	inator		Module offered by				
Manag	ing Dire	ector of the Institute of	Applied Physics	oplied Physics Faculty of Physics and Astronomy				
ECTS	Metho	od of grading	Only after succ. con	Only after succ. compl. of module(s)				
6	nume	rical grade						
Duratio	on	Module level	Other prerequisites					
		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							
and im convolu getic ol transfo Intende The stu les of in	age pro ution p bservat rmation ed learn idents l mage p	n ing outcomes have advanced knowle rocessing and are fami	of signals/sampling th ons and interpolation o image noise, moment dge of digital image an liar with different meth	heorem (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 and to implement the	·					
		number of weekly contact hour			11.			
		mation on SWS (weekl	·					
module is	s creditab	sessment (type, scope, lang le for bonus)						
(approx d) pres Assess and wil	x. 30 m entatio ment o Il be an	mination (90 minutes) inutes per candidate) o n/seminar presentatio ffered: When and how nounced in due form u egulations) 2009.	or c) project report (app n (approx. 30 minutes) often assessment will l	rox. 8 to 10 pages, ti be offered depends o	me to complete: 1 to on the method of ass	6 4 weeks) or		
Allocat	ion of p	olaces						
Additio	nal inf	ormation						
Workload								
Teachi	ng cycl	e						
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)				
Master's w	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • 6 Naster (120 ECTS) FOKUS Phys	-	page 56 / 389		



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 (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 with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 57 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module 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	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					
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							
ter Pr crystall Intende The stu ciples o	Overview of synchrotron radiation and its generation Principles of the interaction between radiation and mat- ter Principles of X-ray optics, X-ray lens Synchroton detector technique X-ray diffractometry (diffraction) of crystalline materials. Intended learning outcomes The students have advanced knowledge of synchrotron radiation and X-ray optics. They know the physical prin- ciples of imaging techniques at the synchrotron and their application for crystalline materials and other materi-					action) of nysical prin- ther materi-		
pret sir	nple in	lages.	of image generation and s, language — if other than Gen	·				
			y contact hours) and co		able)			
Metho	d of ass		guage — if other than German,			ion on whether		
(approx d) pres Assess and wil	x. 30 m entatio ment o Il be an	inutes per candidate) (n/seminar presentatio ffered: When and how	or b) oral examination or c) project report (app n (approx. 30 minutes) often assessment will I nder observance of Sec	rox. 8 to 10 pages, ti pe offered depends o	ime to complete: 1 to on the method of ass	o 4 weeks) or sessment		
Allocat	ion of p	olaces						
 Additional information Workload								
Teaching cycle								
Deferre								
Referred to in LPO I (examination regulations for teaching-degree programmes)								
 Module	e appea	irs in						
Master's wi	ith 1 majo	FOKUS Physics (2010)		• generated 26-Aug-2024 • 6 laster (120 ECTS) FOKUS Phys		page 58 / 389		

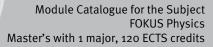


Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics (2010)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 59 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	1

Module title Abbrevia				Abbreviation			
Imagin	g Meth	ods at the Synchrotro	n		11-BMS-131-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	Only after succ. compl. 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	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 semesters.				
Conten	Its						
	rinciple	s of X-ray optics, X-ray	nd its generation Prin lens Synchroton dete				
Intende	ed lear	ning outcomes					
ciples of als. The pret sir Course	of imag ey unde mple im s (type, r	ing techniques at the serstand the principles of ages.	dge of synchrotron rad synchrotron and their a of image generation and rs, language — if other than Ge	pplication for crystal d are able to explain rman)	line materials and of different techniques	ther materi-	
			y contact hours) and co				
		sessment (type, scope, lang le for bonus)	guage — 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 nation r	prox. 30 minutes per ca presentation/seminar p ffered: When and how	ninutes) or b) oral exam andidate) or c) project r presentation (approx. 30 often assessment will inder observance of Se nglish	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	
Allocat	ion of j	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) Physics (2	010)				
Master's w	aster's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 60 / 389 data record Master (120 ECTS) FOKUS Physik - 2010						

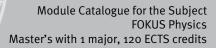
Julius-Maximilians-UNIVERSITÄT WÜRZBURG



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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 61 / 389
	data record Master (120 ECTS) FOKUS Physik - 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	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	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 semesters.				
Contents							
Periodic and aperiodic signals; principles of discreet and exact Fourier transformation; principles of digital signa 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	nage p	rocessing and are fam	dge of digital image an liar with different meth em, especially in the fie	ods of signal proces			
Course	S (type, n	umber of weekly contact hour	s, language — if other than Ge	rman)			
V + R (n	o infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)		
		s essment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informat	ion 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 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	nplete: 1 to 4 sessment	
Allocat							
Additio	nal inf	ormation					
Worklo	ad						
Teachir	ıg cycl	e					
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)			
Module	e appea	ars in					
Master's wi	th 1 majoi	FOKUS Physics (2010)	JMU Würzburg	• generated 26-Aug-2024 • 6	exam. reg.	page 62 / 389	
			data record N	Aaster (120 ECTS) FOKUS Phys	sik - 2010		



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 with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 63 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

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	Metho	od of grading	Only after succ. com	Only after succ. compl. of module(s)			
6	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
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	S (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)		
a) writte in grou weeks) Assess and wil examin Langua	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) 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						
Worklo	ad						
Teachir	ng cvcl	9					
	5,2						
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)			
Module	appea	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)						



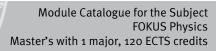
Solid State Physics and Nanostructures

(24 ECTS credits)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 65 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

	e title				Abbreviation	
Opto-e	lectroni	c Material Properties			11-MOE-092-m01	
Module	e coordi	nator		Module offered by		
		ctor of the Institute of	Applied Physics	Faculty of Physics and Astronomy		
	-					
ECTS		d of grading	Only after succ. con	ipl. of module(s)		
5	rr	cal grade				
Duratio	n	Module level	Other prerequisites			
1 seme	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 cours be considered a declaration of will to seek admission to assessme students have obtained the qualification for admission to assessme over the course of the semester, the lecturer will put their registrati 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 qualifie for admission to assessment anew.				the respecti- e course will sessment. If ssessment gistration for s will be ad- mester. For	
Conten	ts			cosment anew.		
		oles of ontoelectronic	material properties and	applications		
		ing outcomes	material properties and			
		· · ·	optoelectronic material			
			rs, language — if other than Ger			
			ly contact hours) and co		-	
		e ssment (type, scope, lan e for bonus)	guage — if other than German, o	examination offered — if no	t every semester, informat	ion on whether
groups project	(approx	. 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	aces				
Additio	nal info	rmation				
Worklo	ad					
Teachir	ng cycle					
	-3 -9 -10					
	d to in l	POL (avamination result)	ions for teaching-degree progra	mmoc)		
Doforro				inines)		
Referre						
		•				
 Module	e appear					
 Module Bachelo	or' degr	ee (1 major) Physics (
 Module Bachelo Master'	or' degre 's degre	ee (1 major) Physics (: e (1 major) Physics (2	010)	5 (2010)		
 Module Bachelo Master' Master'	or' degre 's degre 's degre	ee (1 major) Physics (2 e (1 major) Physics (2 e (1 major) Technolog	010) y of Functional Material			
 Module Bachelo Master' Master' Master'	or' degre 's degre 's degre 's degre	ee (1 major) Physics (e (1 major) Physics (2 e (1 major) Technolog e (1 major) Technolog	010)			
 Bachelo Master' Master' Master' Master'	or' degre 's degre 's degre 's degre 's degre	ee (1 major) Physics (2 e (1 major) Physics (2 e (1 major) Technolog e (1 major) Technolog e (1 major) Nanostruc	010) y of Functional Material y of Functional Material	s (2009)		

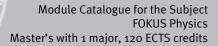




Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) Functional Materials (2012)

		
Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 67 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation					Abbreviation
Critical	Pheno	omena			11-CRP-131-m01
Module	a coord	linator		Module offered by	
		ector of the Institute o	f Theoretical Physics	Faculty of Physics a	and Astronomy
and As			i meoretteat i nystes		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	6	
1 seme	ster	graduate	sessment. The lectu at the beginning of sidered a declaration dents have obtained the course of the se sessment into effec ted to assessment i	erequisites must be met to qualify for admission to as- . The lecturer will inform students about the respective de ginning of the course. Registration for the course will be co declaration of will to seek admission to assessment. If stu- e obtained the qualification for admission to assessment of the semester, the lecturer will put their registration fo into effect. Students who meet all prerequisites will be an essment in the current or in the subsequent semester. Fo at a later date, students will have to obtain the qualificat on to assessment anew.	
Conten	ts	1			
and to scaling temper Intendo	renorm relation ature of ed lear	nalisation group theor onships, critical expon development. Finite siz ning outcomes	y and discusses selected ents. Mean field theory. ze scaling theory. Exact	d applications. Basic . Renormalisation gro solutions.	duction to critical phenomena c phenomenology: Universality, oup theory. Duality and high-/lov
		know the principles of le problems.	the theory of critical ph	ienomena and are at	ole to apply the calculation me-
			urs, language — if other than Ge		
			kly contact hours) and co		
		sessment (type, scope, lan ble for bonus)	nguage — if other than German,	examination offered — if no	ot every semester, information on whether
nar pre Assess and wil examin	sentati ment c Il be an nation r	ion (approx. 30 minuto offered: When and how	es) v often assessment will under observance of Se	be offered depends	1 to 4 weeks), presentation/semi on the method of assessment 3 ASPO (general academic and
Allocat	ion of	places			
Additio	nal inf	ormation			
	-				
Worklo	ad				
Teachi	ng cycl	e			
 Referre	d to in	LPO (examination regula	tions for teaching-degree progra	ammes)	
				······	
Master's w	ith 1 majo	r FOKUS Physics (2010)	JMU Würzburg	g • generated 26-Aug-2024 •	exam. reg. page 68 / 389
			data record N	Master (120 ECTS) FOKUS Phys	sik - 2010

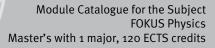


Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 69 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title					Abbreviation		
Applied	l Supei	rconduction			11-ASL-092-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	Only after succ. compl. of module(s)			
6	nume	rical grade					
Duratio	n	Module level	Other prerequisites	i 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	ts						
			vity. Application in ene alculation of temperatu			ents. Me-	
Intende	ed learı	ning outcomes					
are able able to energy Course	e to eva discus techno s (type, n	aluate the contribution s questions on superc logy. Furthermore, the number of weekly contact hou	nding of superconductives 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 cically question deve stions.	y. They are	
			y contact hours) and co				
module is	creditab	le for bonus)	guage — if other than German,				
in grou c) proje prox. 30 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 n	ninutes) or	
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
Teachir	ıg cycl	e					
Referre	d to in	LPO I (examination regulat	ions for teaching-degree progra	ammes)			
Module							
Bachel	or' deg	ree (1 major) Physics (2	2010)				
Master's wi	th 1 majoi	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e Naster (120 ECTS) FOKUS Phys	-	page 70 / 389	

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)

	title				Abbreviation
Semico	nducto	r Lasers - Principles and	Current Research		11-HLF-092-m01
Module	coordi	nator		Module offered by	·
Managi	ng Dire	ctor of the Institute of Ap	oplied Physics	Faculty of Physics a	ind Astronomy
ECTS Method of grading		Only after succ. com	pl. of module(s)		
6	numer	ical grade			
Duratio	n	Module level	Other prerequisites		
1 semestergraduateCertain prerequisites must be met to qualify for admission to sessment. The lecturer will inform students about the respect at the beginning of the course. Registration for the course will sidered a declaration of will to seek admission to assessment dents have obtained the qualification for admission to assess the course of the semester, the lecturer will put their registration sessment into effect. Students who meet all prerequisites wi ted to assessment in the current or in the subsequent semest sessment at a later date, students will have to obtain the qualidation to admission to assessment anew.		nts about the respective details ion for the course will be con- hission to assessment. If stu- r admission to assessment over will put their registration for as- t all prerequisites will be admit- e subsequent semester. For as-			
Content	ts			sment anew.	
riers and des, las ductor la cade las Intende	d phote ser resc asers. sers, te ed learr	ons. Other topics of the l onators, mode selection, The lecture closes with c orahertz lasers or high-pe ling outcomes	ecture are optical pro dynamic properties a urrent topics of laser erformance lasers.	ocesses in semicond as well as technology research such as qu	d rate equations for charge car- uctors, layer and ridge wavegui- y for the generation of semicon- uantum dot lasers, quantum cas- er physics. They can apply their
knowled	dge to	modern questions and k	now the applications	in the current devel	
		umber of weekly contact hours, l mation on SWS (weekly o			abla)
Method	l of ass	essment (type, scope, langua	· · · · · · · · · · · · · · · · · · ·		able) ot 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					
Assessn and will examina	l be an ation re	nounced in due form unc egulations) 2009.		tion 32 Subsection	
Assessn and will examina	l be an ation re ge of a	nounced in due form unc egulations) 2009. ssessment: German, Eng		tion 32 Subsection	
Assessn and will examina Languag	l be an ation re ge of a	nounced in due form unc egulations) 2009. ssessment: German, Eng		tion 32 Subsection	
Assessn and will examina Languag Allocati	l be ani ation re ge of a: i on of p	nounced in due form unc egulations) 2009. ssessment: German, Eng		tion 32 Subsection	
Assessn and will examina Languag Allocati	l be ani ation re ge of a: i on of p	nounced in due form unc egulations) 2009. ssessment: German, Eng Jaces		ction 32 Subsection	
Assessn and will examina Languag Allocati	l be ani ation re ge of a: ion of p nal info	nounced in due form unc egulations) 2009. ssessment: German, Eng Jaces		tion 32 Subsection	

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) 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)

Appliec					Abbreviation
	d Semi	conductor Physics			11-AHL-092-m01
Module coordinator			Module offered by		
Nanagi	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	npl. 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			
Conten	ts	<u> </u>	admission to assess	sment anew.	
		scusses the nrinciples of	Semiconductor Phys	ics and provides an	exemplary overview of the main
		of electronics, optoelectro		ies and provides an	exemptary overview of the main
ntende	ed lear	ning outcomes			
ding of electror patt, Ba injectio of semi	compo nics (d aritt or on lasei icondu	onent production. They un iode, transistor, field-effe Gunn diode) and of opto r), they know the realisat	nderstand the structu ect transistor, thyristo electronics (photo dio ion possibilities of lo	rre and way of functi or, diac, triac), of mic ode, solar cell, light- w-dimensional charg	eld, they have a basic understan oning of the main components c crowave applications (tunnel, Im emitting diode, semiconductor ge carrier systems on the basis ent developments in the field of
compoi		number of weakly contact hours	if a they then Car	(man)	
		number of weekly contact hours, mation on SWS (weekly			able)
Method	d of ass	· · ·			ot every semester, information on whether
groups project (approx Assessi and wil examin	(appro report x. 30 m ment o Il be an ation r	ox. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of	date, for modules with ime to complete: 1 to ften 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 ir redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment 3 ASPO (general academic and
Allocati	ion of				
πισται		JIACES			

Master's with 1 major FOKUS Physics (2010)

Workload

Teaching cycle

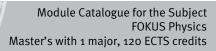
Referred to in LPO I (examination regulations for teaching-degree programmes)

Module appears in

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 75 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Solid State Physics 2 11-FK2-og2-mo1 Module contained in the point of the institute of point of the physics of the physics and Astronomy Faculty of Physics and Astronomy ECTS Method of grading Only after succ. compL of module(S) 8 numerical grade Output intermed in the prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered and claration 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 prerequisites will be acmission to assessment in the current or in the subsequent semester. For assessment at a later date, students who meet all prerequisites will be admission to assessment over the course of the semester. The section subsequent semester. For assessment and unitsion to assessment anew. Contents Contents Contents Intermediate Physics. Electrons in periodic potential - the band structure. Dynamics in the semi-classi can mode. Dielectric properties and ferreelectrics. Semiconductors. Magnetism. Superconductivity. Coupled excitations and optical properties of ferreelectrics. Semiconductors. Magnetism. Superconductivity. Coupled excitations and optical properties (optional) Intermed with figure admission to assessment in the current of not every semester, information on whether modules is reactable for bonsy. Outrit				
Managing Director of the Institute of Applied Physics Faculty of Physics and Astronomy ECTS Method of grading Only after succ. compl. of module(s) 8 numerical grade Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective detail: at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment ove the course of the semester, the lecturer will put their registration for assessment ove the course of the semester, the lecturer will put their registration for assessment at a later date, students will have to obtain the qualification i admission to assessment admission to assessment and mission to assessment and extraction admission to assessment and optical properties [optional] Intended learning outcomes				
ECTS Method of grading Only after succ. compl. of module(s) 8 numerical grade				
8 numerical grade Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment in the beginning of the course. Registration for assessment in the educate of the semester, the lecturer will put their registration for assessment in the effect. Students who meet all prerequisites will be admited to assessment at a later date, students will have to obtain the qualification admission to assessment admission to assessment at a later date, students will have to obtain the qualification in admission to assessment. For assessment in the current or in the subsequent semester. For assessment and extra later date, students will have to obtain the qualification in admission to assessment. For assessment and potential properties [optional] Advanced Solid-State Physics. Electrons in periodic potential - the band structure. Dynamics in the semi-classi cal model. Dielectric properties and ferroelectrics. Semiconductors. Magnetism. Superconductivity. Coupled excitations and optical properties [optional] Intended learning outcomes The students have specific and advanced knowledge in the field of Solid-State Physics. They are theoretically a le to specialise in a sub-discipline of Solid-State Physics. Courses (type, number of weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German)				
Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment in the beginning of the course. Registration for the course will be admitted to cassessment into effect. Students who meet all prerequisites will be admitted to assessment into effect. Students who meet all prerequisites will be admitted to assessment at a later date, students will have to obtain the qualification admission to assessment and extreme and potential properties and ferroelectrics. Semiconductors. Magnetism. Superconductivity. Coupled excitations and optical properties [optional] Intended learning outcomes Intended learning outcomes The students have specific and advanced knowledge in the field of Solid-State Physics. They are theoretically a le to specialise in a sub-discipline of Solid-State Physics. 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 of one candidate each or oral examination or project report (approx. 90 minutes) or b) oral examination of one candidate each or oral examination i groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) or c) project report (approx. 8 to to pages, time to complete: 1 to 4 weeks) or d) presentation/se				
1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment over the course of the semester, the lecturer will put their registration for assessment over the course of the semester, the lecturer will put their registration for assessment over the course of the semester, the lecturer will put their registration is detained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration is admission to assessment into effect. Students who meet all prerequisites will be admited the qualification is admission to assessment at a later date, students will have to obtain the qualification is admission to assessment and admission to assessment and admission to assessment. Effort assessment and the course of the semester, for assessment and put obtain the qualification is admission to assessment. Effort and properties [optional] Intended learning outcomes The students have specific and advanced knowledge in the field of Solid-State Physics. They are theoretically a le to specialise in a sub-discipline of Solid-State Physics. 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 of one candidate each or oral examination on whether module is creditable for bonus) a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examination (approx. 90 minutes) or b) oral examination of one candidate eac				
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Advanced Solid-State Physics. Electrons in periodic potential - the band structure. Dynamics in the semi-classi cal model. Dielectric properties and ferroelectrics. Semiconductors. Magnetism. Superconductivity. Coupled excitations and optical properties [optional] Intended learning outcomes The students have specific and advanced knowledge in the field of Solid-State Physics. They are theoretically a le to specialise in a sub-discipline of Solid-State Physics. 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 i 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				
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 Additional information				
Additional information				
Additional information				
-				
Workload				
Teaching cycle				
Referred to in LPO I (examination regulations for teaching-degree programmes)				
Module appears in				
Master's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 76 / 389 data record Master (120 ECTS) FOKUS Physik - 2010				



Ba	achelor' degree (1 major) Physics (2010)
Ba	achelor' degree (1 major) Physics (2012)
Ma	aster's degree (1 major) Mathematics (2012)
Ma	aster's degree (1 major) Mathematics (2010)
Ma	aster's degree (1 major) Physics (2010)
Ma	aster's degree (1 major) Physics (2011)
Ma	aster's degree (1 major) Nanostructure Technology (2011)
Ma	aster's degree (1 major) Nanostructure Technology (2010)
Ma	aster's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)
Ma	aster's degree (1 major) FOKUS Physics (2010)
Ma	aster's degree (1 major) FOKUS Physics (2011)
Ma	aster's degree (1 major) Computational Mathematics (2012)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 77 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

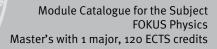
Module	Module title Abbreviation						
Solid State Spectroscopy 11-FKS-092-m01							
Module coordinator				Module offered by			
Manag	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy		
ECTS	Metho	od of grading	Only after succ. con	Only after succ. compl. of module(s)			
6	nume	rical grade					
Duratio	on	Module level	Other prerequisites	Other prerequisites			
1 semestergraduateCertain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective detail at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification 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- t all prerequisites will be admit- e subsequent semester. For as-		
Conten	ts						
-		any-particle picture of e X-ray spectroscopies.	electrons in solids. Ligh	nt-matter interaction.	. Optical spectroscopy. Electron		
Intende	ed lear	ning outcomes					
The students have specific and advanced knowledge in the field of solid-state spectroscopy. They know different types of spectroscopy and their fields of application. They understand the theoretical principles and the current developments in research.							
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							
Additional information							
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
 Module	appea	urs in					
Module appears in							
waster's w	Master's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 78 / 389 data record Master (120 ECTS) FOKUS Physik - 2010 data record Master (120 ECTS) FOKUS Physik - 2010						

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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 79 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
Transport Phenomena in Solids					11-FKT-092-m01	
Module coordinator				Module offered by		
Managing Director of the Institute of Theoretical Physics and Astrophysics			Theoretical Physics	Faculty of Physics a	nd Astronomy	
ECTS		od of grading	Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
DurationModule levelOther prerequisites1 semestergraduateCertain 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- 					ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-	
Conten	ts		·			
Transp	ort phe	nomena in solids.				
Intende	ed lear	ning outcomes				
The stu	Idents	nave specific and adva	anced knowledge in the	field of transport ph	enomena in solids.	
Course	S (type, r	umber of weekly contact hou	rs, language — if other than Ge	rman)		
R + V (r	no infor	mation on SWS (week	ly contact hours) and co	ourse language avail	able)	
		essment (type, scope, lan le 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	(appro report x. 30 m ment o Il be an ation r ge of a	x. 30 minutes per can (approx. 8 to 10 pages inutes) ffered: When and how nounced in due form r egulations) 2009. ssessment: German, E	ninutes) or b) oral exam didate, for modules with s, 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 min entation/seminar pro on the method of as:	nutes) or c) esentation sessment
Allocat	ion of j	olaces				
 •	nalief	ormation				
Auuitio						
Worklo	ad					
Teachi		e				
	3 .,	-				
Referre	d to in	LPO I (examination regulat	tions for teaching-degree progra	ummes)		
Module	e appea	irs in				
Bachel	or' deg	ree (1 major) Physics (ree (1 major) Physics (
Master's wi	ith 1 majo	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • G Aaster (120 ECTS) FOKUS Phys	-	page 80 / 389

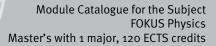
Julius-Maximilians-UNIVERSITÄT WÜRZBURG



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							
Semiconductor Physics 11-HLP-092-m01							
Module coordinator				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	Only after succ. compl. of module(s)			
6	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
DurationInducte tevelOther prerequisites1 semestergraduateCertain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective deta 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 of the course of the semester, the lecturer will put their registration for a sessment into effect. Students who meet all prerequisites will be adrited to assessment in the current or in the subsequent semester. For a sessment at a later date, students will have to obtain the qualification admission to assessment anew.					ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-		
Conten	ts						
ons and sation e	d their effects	mination of crystal bon coupling effects. Electr of semiconductors with	on-phonon coupling. T	emperature-depende	ent transport propert		
Intende	ed leari	ning outcomes					
cal prin	The students have specific and advanced knowledge in the field of Semiconductor Physics. They know the physi- cal principles of semiconductors and have gained an overview of the important characteristics of semiconductor materials.						
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							
Additional information							
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Master's wi	th 1 majoi	FOKUS Physics (2010)		• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys		page 82 / 389	





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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 83 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Semiconductor Nanostructures 11-HNS-092-mo1 Module coordinator Module offered by Managing Director of the Institute of Applied Physics Faculty of Physics and Astronomy ECTS Method of grading Only differe succ. compl. of module(s) Annomical grade Duration Module level Other prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prequisites will be admitted to assessment and lard rade, students will have to obtain the qualification for admission to assessment all are rades. Students will have to obtain the qualification for admission to assessment and will be assessment. The actual properties and light-matter coupling. Moreover, it discusses the challenges and concepts for new of the applied rade and concepts in one of the applied upathm photonic devices based on such nanostructures. Information on will be assessment in of free devices. They are able to apply their knowledge to problem in this field of research. Contents Intended learning outcomes Intended learning outcomes <	Module	e title				Abbreviation
Managing Director of the Institute of Applied Physics Faculty of Physics and Astronomy ECTS Method of grading Only after succ. compl. of module(s) 6 numerical grade Duration Module level Other prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment over the course of the semester, the lecturer will put their registration for assessment over the course of the semester, the lecturer will put their registration for assessment over the course of the semester, the lecturer will put their registration for admission to assessment at a later date, students will have to obtain the qualification for admission to assessment and a sessment at a later date, students will have to obtain the qualification for admission to assessment and the regulation of admission to assessment are sessment and a later date, students will have to obtain the qualification for admission to assessment and unstructures of varying dimensions (20, 10, 00). It provides the basic theoretical concepts to describe their properties, with a focus on optical properties and light-matter coupling. Moreover, it discusses the challenges and concepts or oneouplectronic and quantum photonic devices based on such anaostructures, including building blocks for quantum communication and quantum computing architectures. Interded learning outcomes The students how the theoretical principles and characteristics of semiconductor nanostructures. They have knowledge of the technological methods to fabricate such structures, and of their applications to novel photonic d	Semico	onducto	or Nanostructures			11-HNS-092-m01
ECTS Method of grading Only after succ. compl. of module(s) 6 numerical grade Duration Module level Other prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment over the course of the semester, the lecturer will put their registration for assessment in the current or in the subsequent seessment and will be admitted to assessment in the current or in the subsequent seessment and will be admitted to assessment and the date students will have to obtain the qualification for admission to acsessment (so, populate). The current or in the subsequent seessment (so, populate) is seen admission (so, populate). The current or in the subsequent seessment (so, populate) is seessment (so, populate). The current or in the subsequent seessment (so, populate) is a sessment (so, populate). The current of semiconductor nanostructures are frequently referred to as "artificial materials". In contrast to atoms, molecules or macroscopic crystals, their electronic, optical and magnetic properties can be systematically tailored by changing dimensions (20, 20, 20, 20, 10, 20). It provides the basic theoretical concepts to describe their properties, of novel optoelectronic and quantum photonic devices based on such nanostructures, including building blocks for quantum communication and quantum momputing architectures. Intended learning outcomes Intended learning outcomes The students know the theoretical principles and characteristics of semiconductor nanostructures. They have knowledge to the techonological methods to fabricate such structures, and o	Module	e coord	inator		Module offered by	
6 numerical grade Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students whill have to obtain the qualification for admission to assessment at a later date, students will have to obtain the qualification for admission to assessment are drequest the chological challenges in the preparation of semiconductor nanostructures are frequently referred to as "artificial materials". In contrast to atoms, molecules or macroscopic crystals, their electronic, optical and magnetic properties can be systematically tailored by changing their size. The lecture addresses technological challenges in the preparation of semiconductor nanostructures of novel optoelectronic and quantum photonic devices based on such nanostructures, including building blocks for quantum computing architectures. Intended learning outcomes The students know the theoretical principles and characteristics of semiconductor nanostructures. They have knowledge of the technological methods to fabricate such structures, and of their applications to novel photonic devices. They are able to apply their knowledge to problems in this field of research. Courses type, number of weeky contact hours, language – if other than Gemanio R + V (no information on	Managi	ing Dire	ector of the Institute of Ap	oplied Physics	Faculty of Physics a	nd Astronomy
Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment. If students have obtained the qualification for admission to assessment into entrent or in the subsequent semester. For assessment into effect. Students who meet all precquisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment at a later date, students will have to admission (20, 20, 00). It provides the basic theoretical concepts to describe their properties, or macroscopic crystals, their electronic, optical and magnetic properties can be systematically tailored by changing dimensions (20, 20, 00). It provides the basic theoretical concepts to describe their properties, of novel optoelectronic and quantum photonic devices based on such nanostructures, including building blocks for quantum communication and quantum computing architectures. Intended learning outcomes The students know the theoretical principles and characteristics of semiconductor nanostructures. They have knowledge to problems in this field of research. Courses (type, number of weekly contact hours, language – if other than Geman) R + V (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than Geman) R + V (no information on SWS (weekly contact hours) an	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecture will up their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment into effect. Students who meet all prerequisites will be admitted to assessment at later date, students will have to obtain the qualification for admission to assessment at later date, students will have to obtain the qualification for admission to assessment and later date, students will have to obtain the qualification for admission to assessment anew. Contents Semiconductor nanostructures are frequently referred to as "artificial materials". In contrast to atoms, molecules or macroscopic crystals, their electronic, optical and magnetic properties can be systematically tailored by changing their size. The lecture addresses technological challenges in the preparation of semiconductor nanostructures of avore optoelectronic and quantum photonic devices based on such nanostructures, including building blocks for quantum computing architectures. Intendel learning outcomes The students know the theoretical principles and characteristics of semiconductor nanostructures. They have knowledge to problems in this field of research. 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)	6	nume	rical grade			
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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 Additional information	knowle	dge of	the technological metho	ds to fabricate such s	tructures, and of the	eir applications to novel photonic
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	Allocat	ion of p	olaces			
	Additio	nal inf	ormation			
Workload						
	Worklo	ad				

Teaching cycle

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)

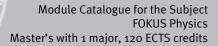
Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 85 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
Lithogr	raphy i	n Semiconductor Techr	ology and Theory of Q	uantum Transport	11-LHQ-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. com	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate	Certain prerequisite sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se sessment into effect ted to assessment in sessment at a later admission to assess	rer will inform stude he 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 respe ion for the course w hission to assessme or admission to asse will put their registra t all prerequisites w e subsequent seme	ctive details vill be con- ent. If stu- essment over ation for as- vill be admit- ster. For as-
Conten	nts					
Introdu	uction to	o the lithographic tech ansport.	niques of semiconducto	or technology and di	scussion of the requ	uired theory
Intendo	ed lear	ning outcomes				
The stu transpo		nave specific and adva	nced knowledge of sem	niconductor lithogra	phy and of the theor	ry of quantum
Course	S (type, r	umber of weekly contact hour	s, language — if other than Ger	rman)		
R + V (r	no infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		s essment (type, scope, lang le for bonus)	guage — if other than German, e	examination offered — if no	ot every semester, informat	tion on whether
groups project (approx Assess and wil examin	(appro t report x. 30 m ment o Il be an nation 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 b nder observance of Sec nglish	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) esentation sessment
Allocat						
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulati	ons for teaching-degree progra	mmes)		
Module	e appea	irs in				
			<u> </u>			
	or' deg	ree (1 major) Physics (2	2010)			

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

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)

Magnetise 11-MAG-092-m01 Module cordinator Module offered by Manasize Director of the Institute of Applied Physics Faculty of Physics - Astronomy ECTS Met+of grading Only after succ. completee of module(s) 6 nume-cal grade Durationationationationationationationation
Managing Director of the Institute of Applied Physics Faculty of Physics and Astronomy ECTS Method of grading Only after succ. compl. of module(s) 6 numerical grade Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective d at the beginning of the course. Registration for the course will be course of the semester, the lecturer will put their registration for sessment into effect. Students who meet all prerequisites will be at ted to assessment in the current or in the subsequent semester. For sessment at a later date, students will have to obtain the qualification admission to assessment admission to assessment anew. Contents Contents
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Dia- and paramagnetism, exchange interaction, ferromagnetism, antiferromagnetism, anisotropy, domain
ture, nanomagnetism, superparamagnetism, experimental methods to measure magnetic properties, Konfect.
Intended learning outcomes
The students know basic terms, concepts and phenomena of magnetism and measuring methods for mag experiments; they are skilled in simple model building and in the formulation of mathematical-physical ap ches and are able to apply them to tasks in the stated areas; they have competencies in independently we on problems of these areas; they are able to evaluate the accuracy of observations and analyses.
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 w module is creditable for bonus)
a) written examination (approx. 90 minutes) or b) oral examination of one candidate each or oral examina groups (approx. 30 minutes per candidate, for modules with less than 4 ECTS credits approx. 20 minutes) project report (approx. 8 to 10 pages, time to complete: 1 to 4 weeks) or d) presentation/seminar presenta (approx. 30 minutes) Assessment offered: When and how often assessment will be offered depends on the method of assessm and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic 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)
Master's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Master (120 ECTS) FOKUS Physik - 2010



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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 89 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
Magne	tism ar	id Spin Transport			11-MST-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	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
2 seme	ester	graduate	sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se sessment into effect ted to assessment in	rer will inform stude 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	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- t all prerequisites will be admit- e subsequent semester. For as- ave to obtain the qualification for	
Conten	ts					
to chara tallic sy tion in rent-inc Intende The stu tic expe	acterise ystems magnet duced s ed learn idents l eriment rview of	e magnetic properties. Du in due consideration of g tic memory. As a last poin spin phenomena. hing outcomes know the basic terms, co ts; they are familiar with s	uring the summer ser giant magnetoresistan nt, we discuss new pl ncepts and phenome spin transport applica area (GMR, TMR). The	nester, the students nee and tunnel magn nenomena from the na of magnetism an ations of information by are skilled in simp	Il (individual usage) and methods learn about spin transport in me- netoresistance and its applica- field of spin dynamics and cur- d measuring methods for magne- n technologies and have gained ole model building and in the for- sks in the stated areas.	
		umber of weekly contact hours, l				
V + R +	V (no i	nformation on SWS (weel	kly contact hours) an	d course language a	vailable)	
			ge — if other than German, e	examination offered — if no	t every semester, information on whether	
groups project (approx Assess and wil examin Langua	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					
Allocat	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

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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 91 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	title				Abbreviation
Nanoar	alytics	5			11-NAN-092-m01
Module	coord	inator		Module offered by	
Managi	ng Dire	ector of the Institute of Ap	oplied Physics	Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
6	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 se sessment into effect ted to assessment in	rer will inform stude 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 the 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- t all prerequisites will be admit- e subsequent semester. For as- ave to obtain the qualification for
Conten	ts				
level up of X-ray py. Sca croscop ray abs Intende The stu vel. The pic met search Course R + V (n Methoo module is a) writte groups project	b to an metho nning t be Se orptior ed learn dents l ey know hods fi metho s (type, r l of ass creditab en exal (appro report	atomic level, examinatio ods Physics and materia cunneling microscopy E condary ions - mass spect ning outcomes nave basic knowledge of v microscoping procedure or the determination of e ds. umber of weekly contact hours, I mation on SWS (weekly co sessment (type, scope, langua le for bonus) mination (approx. 90 min x. 30 minutes per candid (approx. 8 to 10 pages, ti	n of chemical compo al systems on the nar lectron probes: Scan ctrometry - X-ray meth modern research me es that are used in pr lectronic properties. anguage — if other than Ger contact hours) and co ge — if other than German, o nutes) or b) oral exam late, for modules with	sition, spectroscopy noscale Scanning p ning electron micros nods: Synchrotron sp thods for different na actice in labs and th They are able to eval man) purse language availa examination offered — if no ination of one candi n less than 4 ECTS cr	echniques from a microscopic of electronic properties, usage probes: Atomic force microsco- cope. Transmission electron mi- bectroscopy. Photoemission. X- anostructures up to an atomic le- e industry as well as spectrosco- uate the efficiency of different re- able) t every semester, information on whether date each or oral examination in edits approx. 20 minutes) or c) entation/seminar presentation
and wil examin Langua	ment o l be an ation r ge of a	ffered: When and how of nounced in due form unc egulations) 2009. ssessment: German, Eng	ler observance of Sec		on the method of assessment 3 ASPO (general academic and
Allocat	ion of p	Diaces			
Additio	nal inf	ormation			
	- d				
Worklo	ad				

Teaching cycle

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) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 93 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

				Abbreviation
Low-Dimens	sional Structures			11-NDS-092-m01
Module coo	rdinator		Module offered	by
Managing D	irector of the Institute of A	pplied Physics	Faculty of Physic	cs and Astronomy
ECTS Met	hod of grading	Only after succ. con	npl. of module(s)	
4 nun	nerical grade			
Duration	Module level	Other prerequisites	;	
1 semester	graduate	sessment. The lectu at the beginning of sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	rer will inform stu the course. Regis on of will to seek a d the qualification mester, the lectu t. Students who r n the current or ir date, students wi	qualify for admission to as- udents about the respective details tration for the course will be con- admission to assessment. If stu- n for admission to assessment over rer will put their registration for as- neet all prerequisites will be admit- n the subsequent semester. For as- ill have to obtain the qualification for
Contents			sment anew.	
The student know metho semiconduc odes. They a evaluate the dimension I band struct familiar with free electron tor and Land and are able	ods of producing and analy stors as well as the fabrication are familiar with the subbate importance of many-part by applying Poisson's equa ure from the bulk band stru- n the 2D hydrogen atom. The n gas in 2D. They have bas dau degeneracy. They under	vsing such structures. tion and characteristind structure of semic icle effects. They are a ation. They know the l ucture. They have know hey understand how a ic knowledge of the m erstand the depender	They know the b cs of semiconduc onductor heteros able to solve prob <pperturbation to<br="">wledge of the me an external magne- neaning of gaugin ace of various phy</pperturbation>	ow dimensional structures. They andstructures of the most important stor heterostructures and MOS-di- tructures and MOS-diodes and can olems related to potentials in one theory and can deduce the 2D sub- taning of modulation doping and are etic field acts on the properties of a org, Landau-quantisation, filling fac- vsical properties on the filling factor iliar with elementary excitations in
The student know metho semiconduc odes. They a evaluate the dimension b band struct familiar with free electron tor and Land and are able two-dimens	s have knowledge of the the ods of producing and analy stors as well as the fabrica are familiar with the subba e importance of many-part by applying Poisson's equa ure from the bulk band stru- n the 2D hydrogen atom. The gas in 2D. They have bas dau degeneracy. They under to solve implicit problem	vsing such structures. tion and characteristind structure of semic icle effects. They are a ation. They know the l ucture. They have know hey understand how a ic knowledge of the m erstand the depender s via numerical metho	They know the b cs of semiconduc onductor heteros able to solve prob x*p perturbation to wledge of the me an external magne heaning of gaugin face of various phy ods. They are fam	andstructures of the most important tor heterostructures and MOS-di- tructures and MOS-diodes and can blems related to potentials in one theory and can deduce the 2D sub- taning of modulation doping and are etic field acts on the properties of a tog, Landau-quantisation, filling fac- vsical properties on the filling factor
The student know metho semiconduc odes. They a evaluate the dimension I band struct familiar with free electron tor and Land and are able two-dimens	s have knowledge of the the ods of producing and analy stors as well as the fabricat are familiar with the subbat importance of many-part by applying Poisson's equa- ure from the bulk band stru- n the 2D hydrogen atom. The gas in 2D. They have bas dau degeneracy. They und to solve implicit problem ional systems.	vsing such structures. tion and characteristi and structure of semic icle effects. They are a ation. They know the l ucture. They have kno hey understand how a ic knowledge of the m erstand the depender s via numerical metho	They know the b cs of semiconduc onductor heteros able to solve prob <pperturbation to<br="">wledge of the me an external magne neaning of gaugin nee of various phy ods. They are fam</pperturbation>	andstructures of the most important tor heterostructures and MOS-di- structures and MOS-diodes and can blems related to potentials in one theory and can deduce the 2D sub- taning of modulation doping and are etic field acts on the properties of a tog, Landau-quantisation, filling fac- vsical properties on the filling factor iliar with elementary excitations in
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The student know metho semiconduc odes. They a evaluate the dimension l band struct familiar with free electron tor and Land and are able two-dimens Courses (typ- R + V (no inf Method of a module is credi a) written ex groups (app project repo (approx. 30 Assessment and will be examination	s have knowledge of the tl ods of producing and analy stors as well as the fabrical are familiar with the subba e importance of many-part by applying Poisson's equa ure from the bulk band stru- n the 2D hydrogen atom. The gas in 2D. They have bas dau degeneracy. They under to solve implicit problem ional systems. e, number of weekly contact hours, formation on SWS (weekly issessment (type, scope, langu table for bonus) camination (approx. 90 mi rrox. 30 minutes per candie rrt (approx. 8 to 10 pages, f minutes) coffered: When and how o	vsing such structures. tion and characteristi and structure of semic icle effects. They are a ation. They know the l ucture. They have know hey understand how a ic knowledge of the m erstand the depender s via numerical metho language — if other than Ge 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 1 der observance of Sec	They know the b cs of semiconduc onductor heteros able to solve prob <pperturbation to<br="">wledge of the me an external magne heaning of gaugin free of various phy ods. They are fam man) ourse language av examination offered — h less than 4 ECTS 4 weeks) or d) pro- be offered dependent</pperturbation>	andstructures of the most important tor heterostructures and MOS-di- structures and MOS-diodes and can blems related to potentials in one theory and can deduce the 2D sub- taning of modulation doping and ar etic field acts on the properties of a tag, Landau-quantisation, filling fac- visical properties on the filling factor iliar with elementary excitations in vailable)

Additional information

Master's with 1 major FOKUS Physics (2010)	

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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 95 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Master's with 1 major FOKUS Physics (2010)

Module title		Abbreviation			
Nanoelectroni	cs			11-NEL-092-m01	
Module coord	inator		Module offered by		
Managing 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				
Duration	Module level	Other prerequisites			
1 semestergraduateCertain prerequisites must be met to qualify for admission to sessment. The lecturer will inform students about the respect at the beginning of the course. Registration for the course w sidered a declaration of will to seek admission to assessme dents have obtained the qualification for admission to asses the course of the semester, the lecturer will put their registra sessment into effect. Students who meet all prerequisites w ted to assessment in the current or in the subsequent semes sessment at a later date, students will have to obtain the qualification to assessment anew.		nts about the respective details ion for the course will be con- ission to assessment. If stu- r admission to assessment over will put their registration for as- t all prerequisites will be admit- e subsequent semester. For as-			
Contents		L			
discuss terms Afterwards, we function of co of nanostructu	such as Fermi distribution e talk about application p mmon switches and stor	on, density of states a potentials of nanostru ages through miniatu v of nanoelectric amp	and carrier concentra actures in electronics risation and compar	es of nanostructures. First, we tion in view of small structures. 5. We examine the limits of the e them to electronic properties c lattices and circuits and discuss	
Intended lear	ning outcomes				
	nave mastered the basics cations of respective com		nostructures in theor	y and practice. They know functi-	
Courses (type, r	umber of weekly contact hours, l	anguage — if other than Ger	man)		
R + V (no infor	mation on SWS (weekly o	contact hours) and co	urse 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 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	Allocation of places				
 Additional inf	ormation	·			
Workload					
Teaching cycl	6				
	-				
L					

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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)

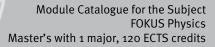
Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)

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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 97 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation						
Nano-Optics 11-NOP-092-m01						
Module coordinator				Module offered by	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 lectu at the beginning of sidered a declaration dents have obtained the course of the set 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					
	•		ight. Microscopy. Option nano-tailored environr	•	•	y. Single
Intende	ed learı	ning outcomes				
			nced knowledge in the as of nano-optics and			th the theo-
Course	S (type, n	umber of weekly contact hour	s, language — if other than Ge	rman)		
R + V (n	io infor	mation on SWS (weekl	y contact hours) and co	ourse language availa	able)	
		s essment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informati	on on whether
groups project (approx Assess and wil examin	(appro report <. 30 m ment o l be an ation r	x. 30 minutes per cano (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 nder observance of Se nglish	h less than 4 ECTS cr 9 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	<u> </u>					
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	ars in				
Bachel	or' deg	ree (1 major) Physics (2	2010)			
Master's wi	th 1 majoı	FOKUS Physics (2010)	-	g • generated 26-Aug-2024 • e Master (120 ECTS) FOKUS Phys	-	page 98 / 389

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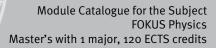


Bachelor' degree (1 major) Physics (2012) Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (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	
Quantum Mechanics II11-QM2-092-m01					
Module coo	rdinator		Module offered by		
Managing Director of the Institute of Theoretical Physics Faculty of Physics and Astronomy and Astrophysics					
	hod of grading	Only after succ. con	pl. of module(s)		
	nerical grade				
Duration	Module level	Other prerequisites			
1 semester	1 semester undergraduate Co so at si do th so te		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		admission to assess			
 2. Band stru 3. Angular m 4. Scattering 5. Relativisti of atomic sp 	uld include: econd quantisation: Fermions and bosons and structures of particles in a crystal ngular momentum, symmetry operators, Lie Algebras cattering theory: Potential scattering, partial wave expansion elativistic quantum mechanics: Klein-Gordon equation, Dirac equation, Loretz group, fine structure splitting tomic spectra uantum entanglement				ure splitting
·	arning outcomes				
The student of the mathe modern theo thods and to	s acquire in-depth know ematical and theoretical pretical Quantum Physic pretical Quantum Physic pretical Condensec	concepts of the listed t s mathematically, to so ysically. The course is p	opics. They are able lve problems analyti pivotal to subsequen	to describe or mode cally, to use approxi t theory courses in A	l problems of mation me- Astrophysics,
Courses (type	e, number of weekly contact hou	rs, language — if other than Ger	rman)		
R + V (no inf	ormation on SWS (week	ly contact hours) and co	ourse language avail	able)	
Method of a module is credit	ssessment (type, scope, lan able for bonus)	guage — 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					
Language of		nglish			demic and

Allocation of places Additional information
Additional 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) 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	
Quantum Phenomena in electronic correlated Materials11-QPM-092-m01						
Module	Module coordinator Module offered by					
		ector of the Institute of	Applied Physics	Faculty of Physics	and Astronomy	
ECTS	1	od of grading		ompl. of module(s)	,	
6	nume	rical grade				
Duratio	on	Module level	Other prerequisit	es		
1 semestergraduateCertain prerequisites must be met to qualify for admis sessment. The lecturer will inform students about the at the beginning of the course. Registration for the cour sidered a declaration of will to seek admission to asse dents have obtained the qualification for admission to the course of the semester, the lecturer will put their re sessment into effect. Students who meet all prerequis ted to assessment in the current or in the subsequent sessment at a later date, students will have to obtain t admission to assessment anew.			ents about the respec- tion for the course w nission to assessme or admission to asse will put their registra et all prerequisites w ne subsequent seme	ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-		
Conten	ts					
		cts and phenomena in lated systems	current solid-state re	search. Correlations.	Free electron gas and	l Fermi liquid.
Intend	ed lear	ning outcomes				
quantu retical	m effe descrip	have specific, advance cts in strongly correlat tion of such systems	ed systems. They are and the current experi	able to understand the mental results.		
	-	umber of weekly contact hou			abla)	
Metho	d of ass	mation on SWS (week sessment (type, scope, lan ole for bonus)	·		•	ion on whether
a) writt groups project (approx Assess and wil examin	en exa (appro report x. 30 m ment o Il be an nation r	mination (approx. 90 n x. 30 minutes per can (approx. 8 to 10 pages	didate, for modules w s, time to complete: 1 r often assessment wi under observance of S	vith less than 4 ECTS c to 4 weeks) or d) pres Il be offered depends	redits approx. 20 min entation/seminar pro on the method of as:	nutes) or c) esentation sessment
Allocat	. –					
Additic	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulation	ions for teaching-degree pro	grammes)		
Module	e appea	ars in				
Master's w	ith 1 majo	r FOKUS Physics (2010)		urg • generated 26-Aug-2024 • d Master (120 ECTS) FOKUS Phy		page 102 / 389



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)

Master's with 1 major FOKUS Physics (2010)

Modul	e title				Abbreviation
Many I	Body Q	uantum Theory			11-QVTP-092-m01
Module coordinator				Module offered by	I
-	ging Dire strophys	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)	
8	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 semestergraduateCertain prerequisites must be met to qualify for admissessment. The lecturer will inform students about the at the beginning of the course. Registration for the cosidered a declaration of will to seek admission to ass dents have obtained the qualification for admission t the course of the semester, the lecturer will put their sessment into effect. Students who meet all prerequited to assessment in the current or in the subsequent sessment at a later date, students will have to obtain		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-			
Conter	ate		admission to assess	Sment anew.	
1 Singl 2 Revie 3 Diagr 4 Diagr 5 Land 6 Supe 7 One-	ew of se rammat rammat au thec ercondu dimens	cle Green's function econd quantization ic method using many p ic method for finite T ory of Fermi liquids ictivity ional systems and bosor		ons at temperature T	=0
		ning outcomes			
		have mastered the princi ed methods to current pr			ticle systems. They are able to ap- 5.
		number of weekly contact hours,			
R + V (I	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)
		Sessment (type, scope, langua Ile for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether
groups project (appro Assess and wi examir	s (appro t report ox. 30 m sment o ill be an nation r	x. 30 minutes per candic (approx. 8 to 10 pages, t inutes) ffered: When and how of	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	date each or oral examination in redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment 3 ASPO (general academic and
-	tion of p		-		
Additio	onal inf	ormation			
			,		

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Workload

Teaching cycle

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

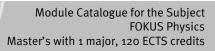
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Module appears in

Bachelor' degree (1 major) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 105 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation		
Relativ	istic Ef	fects in Mesoscopic Sy	stems		11-RMS-092-m01	
Module	e coord	inator		Module offered by		
Managing Director of the Institute of Theoretical Physics and Astrophysics			Theoretical Physics	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 seme	sess at th side dent the o sess ted t sess		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 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	I.	1			
		fects in mesoscopic sys cors Majorana fermior		oling Dirac equatio	n Quantum Hall effe	ect Topo-
-		ning outcomes				
		have mastered the mat he field of mesoscopic				
		number of weekly contact hours	<u> </u>			
R + V (r	no infoi	mation on SWS (weekly	y contact hours) and co	ourse language avail	able)	
		Sessment (type, scope, lang ole for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informatio	n on whether
groups project (approz Assess and wil examin	(appro report x. 30 m ment o Il be an ation r	mination (approx. 90 m ox. 30 minutes per cand (approx. 8 to 10 pages, inutes) ffered: When and how nounced in due form u egulations) 2009. ssessment: German, El	lidate, for modules with , time to complete: 1 to often assessment will l nder observance of Sec	n less than 4 ECTS cr 4 weeks) or d) prese pe offered depends o	edits approx. 20 minu entation/seminar pres	utes) or c) sentation essment
Allocat	ion of _l	places				
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	ars in				
Master's w	ith 1 majo	r FOKUS Physics (2010)	JMU Würzburg	• generated 26-Aug-2024 • 6	exam. reg.	page 106 / 389

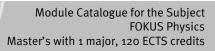


Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Mathematical Physics (2009)
Bachelor' degree (1 major) Mathematical Physics (2012)
Master's degree (1 major) Mathematics (2010)
Master's degree (1 major) Physics (2010)
Master's degree (1 major) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 107 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

	e title				Abbreviation		
Theoretical Solid State Physics				11-TFK-092-m01			
Module coordinator			Module offered by				
	ing Dir	ector of the Institute	of Theoretical Physics	Faculty of Physics a	and Astronomy		
ECTS	<u> </u>	od of grading	Only after succ. con	compl. of module(s)			
8	nume	rical grade					
Duration Module level Ot		Other prerequisites	Other prerequisites				
1 semester graduate		sessment. The lectu at the beginning of 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	its	1					
		Theoretical Solid-Stat tism. Superconducti	te Physics. Fermi liquid th vity.	eory. Electron-electr	on interaction. Varia	ational me-	
		ning outcomes	,				
theory an adv	and to anced	understand the conr topic of solid-state th	etical methods and are a nections to experimental neory and have discussed ours, language — if other than Ge	results. The individu I this topic in a semi	al students have ela		
R + V (r	no infoi	rmation on SWS (wee	ekly contact hours) and co	ourse language avail	able)		
		sessment (type, scope, l ble for bonus)	anguage — if other than German,	examination offered — if no	ot every semester, informat		
module I:						tion on whether	
a) writt groups project (approz Assess and wil examir	(appro report x. 30 m ment o Il be an nation r	ox. 30 minutes per ca (approx. 8 to 10 pag linutes) offered: When and ho	o minutes) or b) oral exam indidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se , English	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (approz Assess and wil examir	(appro report x. 30 m ment o Il be an nation r age of a	ox. 30 minutes per ca (approx. 8 to 10 pag linutes) offered: When and ho mounced in due form regulations) 2009. assessment: German	ndidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (approz Assess and wil examir Langua	(appro report x. 30 m ment o Il be an nation r age of a	ox. 30 minutes per ca (approx. 8 to 10 pag linutes) offered: When and ho mounced in due form regulations) 2009. assessment: German	ndidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (approz Assess and wil examir Langua Allocat	(appro report x. 30 m ment o Il be an nation r age of a tion of	ox. 30 minutes per ca (approx. 8 to 10 pag linutes) offered: When and ho mounced in due form regulations) 2009. assessment: German	ndidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (appro: Assess and wil examir Langua Allocat Additic	(approd report x. 30 m ment o Il be an nation r age of a cion of [ox. 30 minutes per ca (approx. 8 to 10 pag inutes) offered: When and ho nounced in due form regulations) 2009. Issessment: German places	ndidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (approz Assess and wil examir Langua Allocat	(approd report x. 30 m ment o Il be an nation r age of a cion of [ox. 30 minutes per ca (approx. 8 to 10 pag inutes) offered: When and ho nounced in due form regulations) 2009. Issessment: German places	ndidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (appro: Assess and wil examir Langua Allocat Additic Worklo	(approd report x. 30 m ment o Il be an hation r age of a ion of [onal inf	ox. 30 minutes per ca (approx. 8 to 10 pag inutes) offered: When and ho nounced in due form regulations) 2009. assessment: German places	ndidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (appro: Assess and wil examir Langua Allocat Additic	(approd report x. 30 m ment o Il be an hation r age of a ion of [onal inf	ox. 30 minutes per ca (approx. 8 to 10 pag inutes) offered: When and ho nounced in due form regulations) 2009. assessment: German places	ndidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (appro: Assess and wil examir Langua Allocat Additic Worklo Teachin 	(approd report x. 30 m ment o ll be an hation r age of a tion of ponal inf	ox. 30 minutes per ca (approx. 8 to 10 pag inutes) offered: When and ho nounced in due form regulations) 2009. assessment: German places	Indidate, for modules with es, time to complete: 1 to wo often assessment will n under observance of Se , English	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends o ction 32 Subsection	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (appro: Assess and wil examir Langua Allocat Additic Worklo Teachin 	(approd report x. 30 m ment o ll be an hation r age of a tion of ponal inf	ox. 30 minutes per ca (approx. 8 to 10 pag inutes) offered: When and ho nounced in due form regulations) 2009. assessment: German places	ndidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends o ction 32 Subsection	redits approx. 20 mi entation/seminar pr on the method of as	amination in nutes) or c) esentation sessment	
a) writt groups project (appro: Assess and wil examir Langua Allocat Additic Worklo Teachi Referre	(approd report x. 30 m ment o ll be an hation r age of a tion of onal inf onal inf oad	ox. 30 minutes per ca (approx. 8 to 10 pag inutes) offered: When and ho nounced in due form regulations) 2009. assessment: German places	Indidate, for modules with es, time to complete: 1 to ow often assessment will in under observance of Se , English	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends o ction 32 Subsection	redits approx. 20 mi entation/seminar pr on the method of as 3 ASPO (general aca	amination in nutes) or c) esentation sessment	





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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 109 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Master's with 1 major FOKUS Physics (2010)

Module title Abbreviation							
Theory of Su	perconduction			11-TSL-092-m01			
Module coord	linator		Module offered by	<u> </u>			
Managing Dir and Astrophy	ector of the Institute of Tl sics	neoretical Physics	Faculty of Physics a	and Astronomy			
ECTS Meth	od of grading	Only after succ. con	npl. of module(s)				
5 nume	erical grade						
Duration	Module level	Other prerequisites					
1 semestergraduateCertain prerequisites must be met to qualify for sessment. The lecturer will inform students ab at the beginning of the course. Registration for sidered a declaration of will to seek admission dents have obtained the qualification for adm the course of the semester, the lecturer will pu sessment into effect. Students who meet all p 				nts about the respective details ion 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- e subsequent semester. For as-			
				iperconductivity (BCS theory).			
				scopic aspects of superconducti- computing with superconductive			
Intended lear	ning outcomes						
				n of superconductivity. They knov ulation methods to simple pro-			
Courses (type,	number of weekly contact hours,	language — if other than Gei	rman)				
R + V (no info	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)			
Method of as module is credita		age — if other than German,	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 in	formation						
Workload							
Teaching cycle							
	-						

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

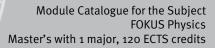
Module appears in

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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)

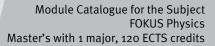
Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 111 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module Managi	nalizati	on Group Methods in I				
Managi			Field Theory		11-RMFT-102-m01	
Managi	e coord	inator		Module offered by	I	
allu AS		ector of the Institute of	Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	· · ·	od of grading	Only after succ. con	npl. of module(s)		
6		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 i	rer 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	alify for admission to nts about the respec- ion for the course win nission to assessment or admission to asses will put their registrates at all prerequisites we e subsequent semest ave to obtain the qu	ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-
Conten	ts					
		on group methods for ı aviour of cryogenic tem	non-linear partial differ peratures.	ential equations, fie	ld theoretical contex	ts and non-
Intende	ed lear	ning outcomes				
		gain an overview of nor alisation group methoc	n-linearities in partial d I.	ifferential equations	and their solution o	n the basis
			s, language — if other than Ge	rman)		
V + R (n	io infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informat	on on whether
groups project (approx Assess and wil examin	(appro report k. 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 l nder observance of Seo nglish	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						
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ng cycl	e				
	d to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)		
 Module appears in						
Module appears in Master's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 112 / 389						



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	Module title Abbreviation						
Spintronics					11-SPI-102-m01		
Module	e coord	inator		Module offered by			
Managi	ng 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	npl. of module(s)			
6	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semester graduate		sessment. The lectur 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 admission to assessment anow.				
Conten	ts						
magnet	toresist	overs the basic principle tance and tunnel magness and current-induced s	etoresistance. As a las	• •	•		
Intende	ed learı	ning outcomes					
mation	techno	know the basic principle blogy. They have gained esistance).					
Course	S (type, n	umber of weekly contact hours	, language — if other than Gei	man)			
V + R (n	o infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)		
		essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	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	nal inf	ormation					
Workload							
Teachir	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)							
						,	
Master's wi	th 1 majoi	r FOKUS Physics (2010)		• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys		page 114 / 389	



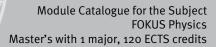
Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 115 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	Module title Abbreviation					
Methoo	ls in Su	Irface Spectroscopy			11-MSS-102-m01	
Module	e coord	inator		Module offered by		
Managi	ing 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)			
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 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					
les of p shape,	hotoel satellit	ectron spectroscopy (P	: Ultra-high vacuum, su ES), one-particle image particles, exemplary sy ods.	e of PES, three step n	nodel, many-particle	effects, line
Intende	ed leari	ning outcomes				
		know the physical prine uate and interpret simp	ciples and experimenta le measurements.	l methods of surface	e spectroscopy. They	are able to
Course	S (type, r	umber of weekly contact hour	s, language — if other than Gei	rman)		
V (no ir	format	ion on SWS (weekly co	ntact hours) and cours	e language available	2)	
		s essment (type, scope, lang 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						
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Master's wi	th 1 majo	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 116 / 389

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 title					Abbreviation
Electro	n Elect	ron Interaction			11-EEW-102-m01
Module	e coord	linator		Module offered by	l
	ing Dir	ector of the Institute	of Theoretical Physics	Faculty of Physics a	and Astronomy
ECTS		od of grading	Only after succ. con	npl. of module(s)	
4 numerical grade					
Duratio		Module level	Other prerequisites	;	
1 semester		graduate	sessment. The lectu at the beginning of sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	arer will inform stude the course. Registrat on of will to seek adn d the qualification for mester, the lecturer t. Students who mee n the current or in th date, students will h	alify for admission to as- ents about the respective details tion for the course will be con- nission to assessment. If stu- or admission to assessment over will put their registration for as- et all prerequisites will be admit- te subsequent semester. For as- nave to obtain the qualification for
Conten	ts	1			
teractio thod of	on). 4. functi	Introduction to bosor	n phase fields and interactor ormalisation groups.8. C	ctions. 5. Calculation	nsional electron gas (without in- of correlation functions. 6. Me- . 9. One-dimensional lattice mo-
Intende	ed lear	ning outcomes			
	Idents	know the principles o	of the theoretical descript	tion of electron-elect	ron interactions in one dimensi-
on.	- ()				
	-		ours, language — if other than Ge ekly contact hours) and co		aple)
			· · · · · · · · · · · · · · · · · · ·		ot every semester, information on whether
		ble for bonus)	anguage in other than definally,		of every semester, mornation on whether
groups project (approx Assess and wil examin	(appro report x. 30 m ment o Il be ar nation r	ox. 30 minutes per ca (approx. 8 to 10 pag linutes) offered: When and ho	ndidate, for modules with es, time to complete: 1 to w often assessment will n under observance of Se	h less than 4 ECTS cr 4 weeks) or d) preso be offered depends	idate each or oral examination ir redits approx. 20 minutes) or c) entation/seminar presentation on the method of assessment 3 ASPO (general academic and
Allocat	ion of	places			
Additio	onal inf	ormation			
Worklo	ad				
 • · · ·		-			
Teachiı	ng cycl	e			
 Dofo					
Keferre	a to in	LPUI (examination regu	lations for teaching-degree progra	ammes)	
 Master's wi	ith 1 maio	r FOKUS Physics (2010)	IMII Würzburg	g•generated 26-Aug-2024●	exam. reg. page 118 / 389
	inaju			Master (120 ECTS) FOKUS Phys	



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)

		·
Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 119 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation						
Theoretical So	olid State Physics 2			11-TFK2-111-m01		
Module coord	inator		Module offered by	<u> </u>		
Managing Dire and Astrophys	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)			
8 nume	rical grade					
Duration	Module level	Other prerequisites				
1 semestergraduateCertain prerequisites must be met to qualify for admi sessment. The lecturer will inform students about the at the beginning of the course. Registration for the co sidered a declaration of will to seek admission to as dents have obtained the qualification for admission the course of the semester, the lecturer will put their sessment into effect. Students who meet all prerequi 			nts about the respective details ion 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- e subsequent semester. For as-			
Contents	L	admission to assess	sinch anew.			
d) electron-ph e) one-dimens Intended learn The students mathematical stand the con	or theoretical methods a	ge of the theoretical d and are able to apply results. The individu	lescription of solid-s them to problems of al students have ela	tate phenomena. They know the f solid-state theory and under- borated on an advanced topic of		
Courses (type, r	number of weekly contact hours, I	anguage — if other than Ger	rman)			
V + R (no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)		
Method of ass module is creditab		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) 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	olaces					
Additional inf	ormation					
Workload	Norkload					

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) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 121 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	Module title				Abbreviation
Introdu	iction t	o Electron Microscopy			11-IEM-111-m01
Module	e coord	inator		Module offered by	
Manag	ing Dire	ector of the Institute of Ap	oplied Physics	Faculty of Physics and Astronomy	
ECTS Method of grading Only after suc		Only after succ. com	pl. of module(s)		
4	nume	rical grade	rade		
Duratio	on	Module level	Other prerequisites		
1 seme	1 semestergraduateCertain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective at the beginning of the course. Registration for the course will be sidered a declaration of will to seek admission to assessment. If dents have obtained the qualification for admission to assessment the course of the semester, the lecturer will put their registration sessment into effect. Students who meet all prerequisites will be ted to assessment in the current or in the subsequent semester. sessment at a later date, students will have to obtain the qualification 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- t all prerequisites will be admit- e subsequent semester. For as-		
Conten	ts		-		
(selecte on tech formati image f 7. Cher	ed-area inique) ion, ima formati nical 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 ? High-resolution ele iicroscopy (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 learı	ning outcomes			
They kr	now mi	croscoping procedures th	nat are used in praction	e in labs and the ind	croscopy up to an atomic level. dustry as well as electron-micros- different research methods.
Course	S (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)
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information 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 ir 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				

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) 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)	

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	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation	
Field Th	neory i	n Solid State Physics			11-FTFK-112-m01
Module	e coord	inator		Module offered by	
Managing Director of the Institute of Theo and Astrophysics		neoretical Physics	ics Faculty of Physics and 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	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 adm 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- t all prerequisites will be admit- e subsequent semester. For as-
Conten	ts		1		
outline 1 Coher 2 The fu 3 Pertur 4 Order 5 Green	This will usually be a course on quantum many particle physics using the method of functional integration. An outline could be: 1 Coherent states and review of second quantization 2 The functional integral formalism at finite temperatures T 3 Perturbation theory at T=0 4 Order parameters and broken symmetry 5 Green's functions 6 The Landau theory of Fermi liquids			a or functional integration. An	
Intende	ed lear	ning outcomes			
		have mastered the princi ed methods to current pr			icle systems. They are able to ap-
Course	S (type, r	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	urse 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
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					
Additio	nal inf	ormation			
Worklo	ad				

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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 125 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

	e title				Abbreviation
Densit	y Funct	ional Theory and the Ph	ysics of Oxide Hetero	structure	11-DFT-142-m01
Modul	e coord	linator		Module offered by	
chairp	erson o	f examination committe	e	Faculty of Physics	
		Only after succ. con	. · · ·		
	1	rical grade			
4 Duratio		Module level			
			Other prerequisites		
1 seme		graduate			
Conter					
of dens	sity fun mmes s	ctional theory. They are	able to model problem	ns of Theoretical Ph	d with the principles and method ysics with the help of important the help of density functional
Intend	ed lear	ning outcomes			
of den	sity fun mmes s	ctional theory. They are	able to model problem	ns of Theoretical Ph	d with the principles and method ysics with the help of important the help of density functional
		number of weekly contact hours	, language — if other than Ge	rman)	
	-	rmation on SWS (weekly			lable)
			· · · · ·		ot every semester, information on whether
	s creditat		aage in other than German,	examination onered in n	of every semester, information on whether
a) writt (appro	ten exa x. 30 m	mination (90 minutes) c inutes per candidate, fo	or modules with less th	nan 4 ECTS credits a	ch or oral examination in groups pprox. 20 minutes) or c) project sentation/seminar presentation
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-	Module title				Abbreviation	
Computational Materials Science					11-CMS-122-m01	
Modul	le coord	linator		Module offered by		
	ging Dir strophy	ector of the Institute of sics	Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	T	od of grading	Only after succ. con	npl. of module(s)		
8	numerical grade					
Durati		Module level	Other prerequisites	i		
1 Seme	ester	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	sites must be met to qualify for admission to as- ecturer will inform students about the respective of of the course. Registration for the course will be ation of will to seek admission to assessment. If s ined the qualification for admission to assessment e semester, the lecturer will put their registration f fect. Students who meet all prerequisites will be nt in the current or in the subsequent semester. F ter date, students will have to obtain the qualification		ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-
Conte	nts	l		Sinch anew.		
ten pro 4-5 top the exc Intend Theore liarity	ogramn pics of f ercise. led lea etical tr with DF	basic ideas of different nes. Electronic submiss the lecture/exercise (fre ming outcomes eatment of the above to T software packages su	ion of all exercises and eely chosen by the stud opics complemented by uch as VASP or Wien2k	l approx. 20 minutes ent) with a little mor / hands-on tutorials and and constructio	presentation about e elaboration on the to be held in the CIP n of maximally locali	one of the topic than in -Pool. Fami- ized Wannier
materi as the	ials. Kn Kondo	projecting DFT results o owledge how to obtain regime. Ability to use in for the solution of the D	many-body solutions o mpurity solvers based o	f the AIM and explor on exact diagonaliza	e some of its limiting	opological
Course	es (type,	number of weekly contact hour	rs. language — if other than Ge			
	(no info		.,	rman)		
V + R (rmation on SWS (weekl			able)	
Metho		rmation on SWS (weekl sessment (type, scope, lang ble for bonus)	y contact hours) and co	ourse language avail		ime quantum
Metho module i a) writ (appro d) pres Assess and wi examin	is credita tten exa ox. 30 n sentatio sment o ill be au nation	sessment (type, scope, lang	y contact hours) and co guage — if other than German, or b) oral examination or c) project report (app on (approx. 30 minutes) often assessment will inder observance of Sec	ourse language avail examination offered — if no of one candidate eac prox. 8 to 10 pages, t be offered depends o	ot every semester, informat ch or oral examination ime to complete: 1 to on the method of as:	ion on whether on in groups o 4 weeks) on sessment
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Metho module i a) writ (appro d) pres Assess and wi examin Langua	is credita ten exa ox. 30 n sentatio sment o ill be an nation age of a	sessment (type, scope, lang ble for bonus) mination (90 minutes) ninutes per candidate) o on/seminar presentatio offered: When and how nnounced in due form u regulations) 2009. assessment: German or	y contact hours) and co guage — if other than German, or b) oral examination or c) project report (app on (approx. 30 minutes) often assessment will inder observance of Sec	ourse language avail examination offered — if no of one candidate eac prox. 8 to 10 pages, t be offered depends o	ot every semester, informat ch or oral examination ime to complete: 1 to on the method of as:	ion on whether on in groups o 4 weeks) o sessment
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Metho module a) writ (appro d) pres Assess and wi examin Langua Alloca	is credita tten exa bx. 30 n sentation sment of ill be an nation age of a ttion of	sessment (type, scope, lang ble for bonus) mination (90 minutes) ninutes per candidate) o on/seminar presentatio offered: When and how nnounced in due form u regulations) 2009. assessment: German or places	y contact hours) and co guage — if other than German, or b) oral examination or c) project report (app on (approx. 30 minutes) often assessment will inder observance of Sec	ourse language avail examination offered — if no of one candidate eac prox. 8 to 10 pages, t be offered depends o	ot every semester, informat ch or oral examination ime to complete: 1 to on the method of as:	ion on whether on in groups o 4 weeks) o sessment
Metho module i a) writ (appro d) pres Assess and wi examin Langua Alloca Additio	is credita ten exa bx. 30 n sentation sment of ill be an nation age of a tion of	sessment (type, scope, lang ble for bonus) mination (90 minutes) ninutes per candidate) o on/seminar presentatio offered: When and how nnounced in due form u regulations) 2009. assessment: German or places	y contact hours) and co guage — if other than German, or b) oral examination or c) project report (app on (approx. 30 minutes) often assessment will l inder observance of Sec English	ourse language avail examination offered — if no of one candidate eac prox. 8 to 10 pages, t be offered depends o	ot every semester, informat ch or oral examination ime to complete: 1 to on the method of as: 3 ASPO (general aca	ion on whether on in groups o 4 weeks) o sessment

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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 128 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title					Abbreviation	
Compu	Itationa	al Materials Science			11-CMS-131-m01	
Module	e coord	linator		Module offered by		
Managing Director of the Institute of Theoretical Phys and Astrophysics		Theoretical 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	on	Module level	Other prerequisites			
1 semestergraduateCertain prerequisites must be met to qualify for admission to sessment. The lecturer will inform students about the respect at the beginning of the course. Registration for the course will sidered a declaration of will to seek admission to assess 		ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit-				
Conten	nts	1			•	
interac plemer ten pro 4-5 top the exe Intende	tion, d nt the b ogramm oics of t ercise. ed lear	introduction to continu ynamic mean field theo pasic ideas of different a nes. Electronic submissi he lecture/exercise (fre ning outcomes have advanced knowled	ry (DMFT exercise). Lec algorithms, either base ion of all exercises and ely chosen by the stud	ture + 4-5 exercises d on template progra l approx. 20 minutes ent) with a little mor	in the CIP pool. The ammes or on comple presentation about e elaboration on the	exercises im- etely self-writ one of the topic than in
		r the application of thes				
		number of weekly contact hours				
		rmation on SWS (weekly	· · · · · · · · · · · · · · · · · · ·			
		sessment (type, scope, lang ble for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	
		mination (approx oo m				ion on whether
weeks) Assess and wi examir) or d) p sment c Il be ar nation r	prox. 30 minutes per ca presentation/seminar p offered: When and how mounced in due form u regulations) 2009.	ndidate) or c) project r resentation (approx. 30 often assessment will l nder observance of Sec	o minutes) be offered depends o	o pages, time to con on the method of ass	amination 1plete: 1 to 4 sessment
weeks) Assess and wil examir Langua Allocat) or d) p sment c Il be ar nation r age of a	prox. 30 minutes per ca presentation/seminar p offered: When and how mounced in due form u regulations) 2009.	ndidate) or c) project r resentation (approx. 30 often assessment will l nder observance of Sec	eport (approx. 8 to 10 o minutes) be offered depends o	o pages, time to con on the method of ass	amination 1plete: 1 to 4 sessment
weeks) Assess and wil examir Langua Allocat) or d) p sment c Il be ar nation r age of a t ion of	prox. 30 minutes per ca presentation/seminar p offered: When and how mounced in due form u regulations) 2009.	ndidate) or c) project r resentation (approx. 30 often assessment will l nder observance of Sec	eport (approx. 8 to 10 o minutes) be offered depends o	o pages, time to con on the method of ass	amination 1plete: 1 to 4 sessment
weeks) Assess and wil examir Langua Allocat) or d) p sment c Il be ar nation r age of a tion of pnal inf	prox. 30 minutes per ca presentation/seminar p offered: When and how mounced in due form u regulations) 2009. Issessment: German, En places	ndidate) or c) project r resentation (approx. 30 often assessment will l nder observance of Sec	eport (approx. 8 to 10 o minutes) be offered depends o	o pages, time to con on the method of ass	amination 1plete: 1 to 4 sessment
weeks) Assess and wil examir Langua Allocat Additic) or d) p sment c Il be ar nation r age of a tion of pnal inf	prox. 30 minutes per ca presentation/seminar p offered: When and how mounced in due form u regulations) 2009. Issessment: German, En places	ndidate) or c) project r resentation (approx. 30 often assessment will l nder observance of Sec	eport (approx. 8 to 10 o minutes) be offered depends o	o pages, time to con on the method of ass	amination 1plete: 1 to 4 sessment
weeks) Assess and wil examir Langua Allocat Additic) or d) p sment c Il be ar nation r age of a tion of Dnal inf	prox. 30 minutes per ca presentation/seminar p offered: When and how mounced in due form u regulations) 2009. Inssessment: German, En places	ndidate) or c) project r resentation (approx. 30 often assessment will l nder observance of Sec	eport (approx. 8 to 10 o minutes) be offered depends o	o pages, time to con on the method of ass	amination 1plete: 1 to 4 sessment
weeks) Assess and wil examir Langua Allocat Additic Worklo) or d) p sment c Il be ar nation r age of a tion of Dnal inf	prox. 30 minutes per ca presentation/seminar p offered: When and how mounced in due form u regulations) 2009. Inssessment: German, En places	ndidate) or c) project r resentation (approx. 30 often assessment will l nder observance of Sec	eport (approx. 8 to 10 o minutes) be offered depends o	o pages, time to con on the method of ass	amination 1plete: 1 to 4 sessment
weeks) Assess and wil examir Langua Allocat Additio Worklo Teachi) or d) p sment c Il be ar nation r age of a tion of Dnal inf	prox. 30 minutes per ca presentation/seminar p offered: When and how mounced in due form u regulations) 2009. Inssessment: German, En places	ndidate) or c) project r resentation (approx. 30 often assessment will l nder observance of Sec	eport (approx. 8 to 10 o minutes) be offered depends o	o pages, time to con on the method of ass	amination 1plete: 1 to 4 sessment

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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 130 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Modul	e title				Abbreviation
Disordered Systems					11-UGS-131-m01
Module coordinator				Module offered by	1
Managing Director of the Institute of Theoretical Physi and Astrophysics		e of Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS		od of grading	Only after succ. cor	npl. of module(s)	
4	nume	erical grade			
Durati	on	Module level	Other prerequisites	;	
1 seme		graduate	sessment. The lectu at the beginning of sidered a declaration dents have obtaine the course of the se sessment into effect	arer will inform stude the course. Registration on of will to seek adr d the qualification for emester, the lecturer t. Students who mee	alify for admission to as- ents about the respective details tion for the course will be con- nission to assessment. If stu- or admission to assessment over will put their registration for as- et all prerequisites will be admit- ne subsequent semesters.
	Part 1 d				or random interactions with the . The students learn to calculate
vers newith rates and in introducing integration of the second se	on-linea andom more t uced se	ar partial differentia inhomogeneity. Whe han one space dime eparately. As a meth od is derived for cla	l equations, which also de ere applicable, exact solut ension, diagram methods a odological development o	scribe systems far b bility in a space dime and renormalisation f the methods of the	mpeting orders. Part II: Part II co- eyond equilibrium and systems ension will be covered; otherwise groups are applied, which will b course Mathematics 3, the path ifferential equations (e.g. Feyn-
Intend	led lear	ning outcomes			
randoı stems of non	m parar and no -ordere	meters. They learn to n-equilibrium differ ed systems are often	o construct diagram develo ential equations. They unc times simpler and how a	opments for specific lerstand why physic new order arises from	and non-physical models with models, both for Hamiltonian sy al laws describing the behaviour m disorder. They learn to differen l as between disorder and chaos
Course	es (type,	number of weekly contact	hours, language — if other than Ge	rman)	
V + R (no info	rmation on SWS (we	eekly contact hours) and co	ourse language avai	lable)
		sessment (type, scope, ble for bonus)	language — if other than German,	examination offered — if n	ot every semester, information on whether
in grou weeks	ıps (ap	prox. 30 minutes pe		eport (approx. 8 to 1	idate each or oral examination o pages, time to complete: 1 to 4

examination regulations) 2009. Language of assessment: German, English

Allocation of places

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Additional information

Workload

|--|

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) FOKUS Physics (2010)

Master's degree (1 major) FOKUS Physics (2011)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 132 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title					Abbreviation	
Solid State Spectroscopy 2 11-FKS2-132-m01						
Module coordinator Module offered by						
Managing Director of the Institute of Applied Physics Faculty of Physics an		nd Astronomy				
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)		
6	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Its	5				
and ex gation gnetic of excit agreem	citation of mag and ele tations nent.	ering methods; neutron is such as phonons and netic, orbital and charg ctronic properties of th in solids and thin films	l magnetic waves; reso e order; X-ray and neu in films and superlatti	onant elastic X-ray sc tron reflectometry; in ces; resonant inelast	attering and absorp westigation of the st ic X-ray scattering; i	tion; investi- ructural, ma- nvestigation
	-	ning outcomes				
tering,	moderi	know different modern n scattering theory, X-ra th the theoretical princ	and neutron reflecto	metry and resonant i		
Course	S (type, r	umber 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)	
		s essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	on on whether
in grou weeks) Assess and wi examir	ps (app or d) p ment o Il be an nation r	mination (approx. 90 m prox. 30 minutes per ca resentation/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 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	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 Master Master Master	''s degr ''s degr ''s degr ''s degr	ee (1 major) Physics (20 ee (1 major) Physics (20 ee (1 major) Nanostruct ee (1 major) Nanostruct ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy	011) ure Technology (2011) ure Technology (2010) sics (2010)			
		FOKUS Physics (2010)		• generated 26-Aug-2024 • 6	exam. reg.	page 133 / 389
				Aaster (120 ECTS) FOKUS Phys	-	

Module	e title			,	Abbreviation	
Physics	s of Ad	vanced Materials			11-PMM-132-m01	
Module	e coord	inator		Module offered by	л	
Managi	ing Dire	ector of the Institute of	Applied Physics	Faculty of Physics a	and Astronomy	
ECTS		od of grading	Only after succ. con	· · ·		
6		rical grade		• • • •		
Duratio	•	Module level	Other prerequisites			
1 seme		graduate				
Conten		Sidduite				
		erties of various materia	 Il groups such as liquid	ls liquid crystals an	d nolymers• magnet	ic materials
and su	percon	ductors; thin films, het imensional layer mater	erostructures and supe			
Intende	ed lear	ning outcomes				
The stu	dents	know the properties an	d characterising metho	ds of some modern	materials.	
Course	S (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
V + R (n	no infor	mation on SWS (weekly	/ contact hours) and co	ourse language avail	able)	
Method	d of ass	sessment (type, scope, lang le for bonus)				ion on whether
Assess and wil examin	ment o Il be an iation r	resentation/seminar p ffered: When and how nounced in due form u egulations) 2009. ssessment: German, Eu	often assessment will nder observance of Se	be offered depends of		
Allocat	ion of _l	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cvcl	e				
	0 -)					
Referre	d to in	LPOI (examination regulation	ons for teaching-degree progra	ammes)		
	<u></u>					
Module	e appea	ars in				
		ree (1 major) Physics (2	010)			
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)						
	-	ee (1 major) Physics (20				
Master's degree (1 major) Nanostructure Technology (2011)						
Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) FOKUS Physics (2010)						
	-	ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy				
master	s uegi	cc (1 majui) i UKUS PIIY	3103 (2011)			
Master's wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e Master (120 ECTS) FOKUS Phys	-	page 134 / 389

Module	title				Abbreviation	
Topolog	gical O	rder			11-TOPO-132-m01	
Module	coordi	nator		Module offered by		
Managi	ng Dire	ctor of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	d of grading	Only after succ. con	pl. of module(s)		
6	numer	ical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Content	ts					
These p logical of 1) The fr 2) The fr ferroma 3) The to go). 4) Majo ons. The Intende The stud Courses V + R (n Method module is a) writte in group weeks) Assess and will examina	hases quantu raction raction gnets. opolog rana fe e lectur dents a c lectur dents a f (type, n o infor l of ass creditable en exar os (app or d) p ment of l be an ation re	id-State Physics, the co possess no order in the m numbers. Examples al charge and statistics al quantisation of spin ical anomalies of fracti rmion states at the inter e explains the fundam ing outcomes acquire in-depth knowle umber of weekly contact hours mation on SWS (weekly essment (type, scope, lang e for bonus) nination (approx. 90 m rox. 30 minutes per ca resentation/seminar per ffered: When and how of nounced in due form un egulations) 2009. ssessment: German, Er	e conventional sense of of topological quantur of quasiparticle excita s in spin liquids and the onally quantised system ental concepts with the edge of topological orce , language — if other than Ger or contact hours) and contain uage — if other than German, inutes) or b) oral examplication (approx. 30 often assessment will liptication of Second	f a broken symmetry n numbers or phases ation in quantum Hal e accompanying spl ms on the torus (or g ogical superconducto e help of basic exam der in quantum conder man) ourse language availa examination offered — if no ination of one candi eport (approx. 8 to 10 o minutes) pe offered depends of	y, but are characteris include: I fluids. it-up of spin and char generally on surfaces ors and topologically ples. ensates. able) t every semester, informati date each or oral exa o pages, time to com	ed by topo- arge in anti- s with gender trivial regi- on on whether amination aplete: 1 to 4 sessment
Allocati	-					
Additio	nal info	ormation				
Workloa	ad					
Teachin	ıg cycle	9				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
Module	appea	rs in				
Master' Master'	s degre s degre	ee (1 major) Physics (20 ee (1 major) Physics (20 ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy	11) sics (2010)			
Master's wit	th 1 major	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 135 / 389

Module	title				Abbreviation
Topology in Solid State Physics			11-TFP-132-m01		
Module coordinator				Module offered by	
Managing Director of the Institute of Applied Physics		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 seme	ster	graduate			
Conten	ts	5			
		are familiar with the theo ecessary for their descrip			ysics. They know the mathemati- s to simple problems.
Intende	ed learr	ning outcomes			
		are familiar with the theo ecessary for their descrip	, , ,		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) Assess 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
Allocat	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	e appea	irs in			
		ee (1 major) Physics (2010	o)		
	-	ee (1 major) Physics (201			
	-	ee (1 major) Nanostructur			
	-	ee (1 major) Nanostructur			
	-	ee (1 major) FOKUS Physi			
Master'	's degre	ee (1 major) FOKUS Physi	cs (2011)		



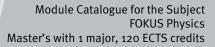
Astrophysics and Particle Physics

(24 ECTS credits)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 137 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

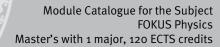
Modul	e title				Abbreviation		
Astrop	hysics				11-A4-072-m01		
Modul	e coord	inator		Module offered by			
	ing Dire	ector of the Institute of sics	Theoretical Physics	Faculty of Physics a	and Astronomy		
ECTS	1	od of grading	Only after succ. con	npl. of module(s)			
6		rical grade		•			
1 semester undergraduate Admission prere		Other prerequisites	;				
1 seme	ester	undergraduate	50% of exercises. C sion to assessment ve details at the beg be considered a de students have obta over the course of t 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			
Conter			for admission to as	sessment anew.			
nucleo Intende The stu physice	synthe ed lear udents al obse ney kno	sis, cosmic microwave ning outcomes are familiar with the m rvations and evaluatio	, Friedmann World Mod background radiation, odern world view of Ast ns. They are able to use universe, e.g. of stars a	structure formation, rophysics. They know e these methods to p	inflation w methods and tools blan and analyse own	s for astro- n observati-	
		number of weekly contact hou	rs, language — if other than Ge	rman)			
V + S (I	no info	rmation on SWS (week	ly contact hours) and co	ourse language avail	able)		
		S essment (type, scope, lan ole for bonus)	guage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether	
written	exami	nation (approx. 120 mi	nutes)				
Allocat	tion of	places					
Only as	s part o	f pool of general key s	kills (ASQ): 15 places. P	laces will be allocate	ed by lot.		
Additio	onal inf	ormation					
Worklo	oad						
Teachi	ng cycl	e					
Referre	ed to in	LPO I (examination regulat	ions for teaching-degree progra	ammes)			
	e appea						
Bachel	lor' deg	ree (1 major) Physics (2007)				
Master's w	vith 1 majo	r FOKUS Physics (2010)		• generated 26-Aug-2024 • Master (120 ECTS) FOKUS Phys		page 138 / 389	





Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2009) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Physics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Mathematics (2012) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (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) Bachelor's degree (1 major, 1 minor) Physics (Minor, 2008) Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)

Modul	e title				Abbreviation	
Astron	omical	Methods			11-ASM-131-m01	
Module	e coord	linator		Module offered by		
	ing Dir	ector of the Institute o	f Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS		od of grading	Only after succ. cor	npl. of module(s)		
6		erical grade		• • • •		
Duration Module level Other prerequisites		5				
1 seme	ster	graduate	sessment. The lectu at the beginning of sidered a declaration dents have obtaine the course of the se sessment into effect ted to assessment it	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					
			ny across the electromag y and gamma-ray telesc		action and reduction	n of observa-
		ning outcomes		- I		
dio, op	tical, X		bservational astronomy energies). Knowledge of ervations.			
Course	S (type,	number of weekly contact ho	urs, language — if other than Ge	erman)		
V + R (r	no info	rmation on SWS (weel	kly contact hours) and co	ourse language avail	able)	
		sessment (type, scope, la ble for bonus)	nguage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
in grou weeks) Assess and wi examir	ps (ap or d) p ment c ll be ar nation	prox. 30 minutes per o presentation/seminar offered: When and how	minutes) or b) oral exan candidate) or c) project r presentation (approx. 3 v often assessment will under observance of Se English	eport (approx. 8 to 1 o minutes) be offered depends	o pages, time to con on the method of as:	nplete: 1 to 4 sessment
Allocat	ion of	places				
Additio	onal inf	formation				
Worklo	ad					
Teachi	ng cyc	le				
Referre	ed to in	LPUI (examination regula	ations for teaching-degree progra	ammes)		
Modul	e appe	ars in				
Mactor's w	ith 1 maio	or FOKUS Physics (2010)	IMII Würzburg	g • generated 26-Aug-2024 •		page 140 / 389

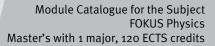


Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011)

Master's with 1 major FOKUS Physics (2010)
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Module	e title				Abbreviation
Introdu	uction t	o Plasmaphysics			11-EPP-092-m01
Module	e coord	inator		Module offered by	1
Manag and As		ector of the Institute c	f Theoretical Physics	Faculty of Physics a	and Astronomy
ECTS	<u> </u>	od of grading	Only after succ. con	npl. of module(s)	
6		rical grade		•	
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate	sessment. The lectur at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	rer will inform stude the course. Registrat on of will to seek adn d the qualification for mester, the lecturer t. Students who mee n the current or in th date, students will h	alify for admission to as- ents about the respective details tion for the course will be con- nission to assessment. If stu- or admission to assessment over will put their registration for as- et all prerequisites will be admit- ne subsequent semester. For as- nave to obtain the qualification fo
Conten	its				
Transp thin the celerat Intende The stu ma. Th Course V + R (r Methoo module is a) writt groups project	ort equ e solar ion anc ed learn idents l ey are a es (type, r no infor d of ass s creditab cen exal (appro report	ations for energetic p wind, Particle acceler I transport in galaxies ning outcomes know the principles o able to solve basic pro- number of weekly contact ho rmation on SWS (week sessment (type, scope, la tele for bonus) mination (approx. 90 ox. 30 minutes per car (approx. 8 to 10 page	articles, Properties of ma ation via shock waves an and other astrophysical f Plasma Physics, especi oblems of Plasma Physic urs, language — if other than Ger kly contact hours) and co nguage — if other than German, minutes) or b) oral exam adidate, for modules with	agnetic turbulence, F nd via interaction wi I objects, Cosmic rac fally the description is and to apply this k rman) ourse language avail examination offered — if no ination of one candion n less than 4 ECTS cr	of transport phenomena in plas- knowledge to Astrophysics.
Assess and will examin	ment o ll be an nation r		under observance of Sec		on the method of assessment 3 ASPO (general academic and
Allocat	<u> </u>		<u> </u>		
Additio	onal inf	ormation			
Worklo	ad				
 Teachi	ng cycl	e			
 Referre	ed to in	LPO I (examination regula	tions for teaching-degree progra	ummes)	
		0			

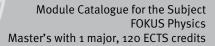




Module appears in Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012) Master's degree (1 major) Mathematics (2012) Master's degree (1 major) Mathematics (2010) 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) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) Computational Mathematics (2012)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 143 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
Cosmology					11-AKM-092-m01	
Module coordinator				Module offered by		
Managing Director of the Institute of Theoretical Physics and Astrophysics				Faculty of Physics and Astronomy		
ECTS Method of grading			Only after succ. cor	Only after succ. compl. of module(s)		
6	1	erical grade				
Duration		Module level	Other prerequisites	ner prerequisites		
1 semester		graduate	sessment. The lectu at the beginning of sidered a declaration dents have obtaine 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 fo admission to assessment anew.		
Conten	its	1				
matter,	, primo	rdial nucleosynthesis		kground, structure fo	e early universe, inflation, dark ormation, supercluster, galaxies	
Intend	ed lear	ning outcomes				
	late th	em to observations. T			ethods of cosmology and are ab- ch topics and are able to work on	
Course	S (type,	number of weekly contact he	ours, language — if other than Ge	rman)		
R + V (r	no info	rmation on SWS (wee	ekly contact hours) and co	ourse language avail	able)	
		sessment (type, scope, la ble for bonus)	anguage — if other than German,	examination offered — if n	ot every semester, information on whether	
groups project (approz Assess and wil examir	(appro report x. 30 m ment o Il be ar nation i	ox. 30 minutes per ca (approx. 8 to 10 pag hinutes) offered: When and ho	ndidate, for modules wit es, time to complete: 1 to w often assessment will u under observance of Se	h less than 4 ECTS co 9 4 weeks) or d) preso 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	
Allocat	ion of	places				
Additio	onal inf	formation				
Worklo	ad					
Teachi	ng cyc	le				
Referre	ed to in	LPOI (examination regul	lations for teaching-degree progra	ammes)		
Aaster's w	ith 1 majo	or FOKUS Physics (2010)	IMU Würzburg	g • generated 26-Aug-2024 •	exam. reg. page 144 / 389	



Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 145 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module co Managing and Astrop ECTS M 6 nu Duration 1 semeste 1 semeste 1 semeste 2 Sem	Director of the Institute of ohysics ethod of grading merical grade Module level r graduate trophysics: Dynamics of ch cles. Properties of magneti on via shock waves and via nd other cosmic objects. earning outcomes nts have basic knowledge d acceleration of charged	Only after succ. con Other prerequisites Sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the ser sessment into effect ted to assessment in sessment at a later admission to assess harged particles in election ic turbulence. Propagata a interaction with plasm	s must be met to qualify for admission to as- irer will inform students about the respective d the course. Registration for the course will be c on of will to seek admission to assessment. If s d the qualification for admission to assessmer mester, the lecturer will put their registration for t. Students who meet all prerequisites will be a n the current or in the subsequent semester. Fo date, students will have to obtain the qualifica	on- tu- or as- admit- or as- tion for or ener ticle
Managing and Astrop ECTS M 6 nu Duration 1 semester 1 semester 1 semester 2 s	Director of the Institute of ohysics ethod of grading merical grade Module level r graduate trophysics: Dynamics of ch cles. Properties of magneti on via shock waves and via nd other cosmic objects. earning outcomes nts have basic knowledge d acceleration of charged	Only after succ. con Other prerequisites Sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the ser sessment into effect ted to assessment in sessment at a later admission to assess harged particles in election ic turbulence. Propagata a interaction with plasm	Faculty of Physics and Astronomy npl. of module(s) s must be met to qualify for admission to as- irer will inform students about the respective d the course. Registration for the course will be of on of will to seek admission to assessment. If s d the qualification for admission to assessment mester, the lecturer will put their registration for t. Students who meet all prerequisites will be a n the current or in the subsequent semester. For date, students will have to obtain the qualification sment anew. tric and magnetic fields. Transport equations f ion of solar particles within the solar wind. Par	on- tu- or as- admit- or as- tion for or ener ticle
and Astrop ECTS Ma 6 nu Duration 1 semester 1 semester 1 semester 2 semester	ethod of grading Imerical grade Module level r graduate Strophysics: Dynamics of ch cles. Properties of magneti on via shock waves and via nd other cosmic objects. earning outcomes nts have basic knowledge d acceleration of charged p	Only after succ. con Other prerequisites Sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the ser sessment into effect ted to assessment in sessment at a later admission to assess harged particles in election ic turbulence. Propagata a interaction with plasm	npl. of module(s) s must be met to qualify for admission to as- irer will inform students about the respective d the course. Registration for the course will be o in of will to seek admission to assessment. If s d the qualification for admission to assessmer mester, the lecturer will put their registration for t. Students who meet all prerequisites will be a in the current or in the subsequent semester. For date, students will have to obtain the qualifica sment anew.	on- tu- or as- admit- or as- tion for or ener ticle
6 nu Duration 1 semester 1 semester 2 semest	Immerical grade Module level r graduate strophysics: Dynamics of cles. cles. Properties of magneties of magneties of via shock waves and via and other cosmic objects. earning outcomes nts have basic knowledge d acceleration of charged period	 Other prerequisites Certain prerequisites sessment. The lecture at the beginning of sidered a declaration dents have obtained the course of the serent sessment into effect ted to assessment in sessment at a laterres admission to assesses harged particles in election ic turbulence. Propagata	s must be met to qualify for admission to as- irer will inform students about the respective d the course. Registration for the course will be o on of will to seek admission to assessment. If s d the qualification for admission to assessmer mester, the lecturer will put their registration for t. Students who meet all prerequisites will be a n the current or in the subsequent semester. For date, students will have to obtain the qualification sment anew.	on- tu- or as- admit- or as- tion for or ener ticle
Duration 1 semester 1 semester 2 Semest	Module level r graduate r graduate strophysics: Dynamics of chase cles. Properties of magneti on via shock waves and via nd other cosmic objects. earning outcomes nts have basic knowledge d acceleration of charged	Certain prerequisite sessment. The lectu at the beginning of sidered a declaratio dents have obtained the course of the se sessment into effec ted to assessment i sessment at a later admission to assess harged particles in elect ic turbulence. Propagat	s must be met to qualify for admission to as- irer will inform students about the respective d the course. Registration for the course will be o on of will to seek admission to assessment. If s d the qualification for admission to assessmer mester, the lecturer will put their registration for t. Students who meet all prerequisites will be a n the current or in the subsequent semester. For date, students will have to obtain the qualificat sment anew.	on- tu- or as- admit- or as- ition fo or ener ticle
1 semester Contents Plasma As getic parti- acceleration galaxies a Intended l The studer motion an compare a	r graduate strophysics: Dynamics of ch cles. Properties of magneti on via shock waves and via nd other cosmic objects. earning outcomes nts have basic knowledge d acceleration of charged	Certain prerequisite sessment. The lectu at the beginning of sidered a declaratio dents have obtained the course of the se sessment into effec ted to assessment i sessment at a later admission to assess harged particles in elect ic turbulence. Propagat	s must be met to qualify for admission to as- irer will inform students about the respective d the course. Registration for the course will be o on of will to seek admission to assessment. If s d the qualification for admission to assessmer mester, the lecturer will put their registration for t. Students who meet all prerequisites will be a n the current or in the subsequent semester. For date, students will have to obtain the qualificat sment anew.	con- tu- or as- admit- or as- ition fo or ener ticle
Contents Plasma As getic parti acceleratio galaxies a Intended l The studer motion an compare a	trophysics: Dynamics of ch cles. Properties of magneti on via shock waves and via nd other cosmic objects. earning outcomes nts have basic knowledge d acceleration of charged	sessment. The lectu at the beginning of sidered a declaratio dents have obtained the course of the se sessment into effec ted to assessment i sessment at a later admission to assess harged particles in elect ic turbulence. Propagat	the course. Registration for the course will be on of will to seek admission to assessment. If s d the qualification for admission to assessment mester, the lecturer will put their registration for t. Students who meet all prerequisites will be a n the current or in the subsequent semester. For date, students will have to obtain the qualification sment anew.	con- tu- or as- admit- or as- ition fo or ener ticle
Plasma As getic parti acceleratio galaxies a Intended l The studer motion an compare a	cles. Properties of magneti on via shock waves and via nd other cosmic objects. earning outcomes nts have basic knowledge d acceleration of charged	harged particles in elec ic turbulence. Propagat a interaction with plasn	tric and magnetic fields. Transport equations f ion of solar particles within the solar wind. Par	ticle
getic parti acceleratio galaxies a Intended l The studer motion an compare a	cles. Properties of magneti on via shock waves and via nd other cosmic objects. earning outcomes nts have basic knowledge d acceleration of charged	ic turbulence. Propagat a interaction with plasn	ion of solar particles within the solar wind. Par	ticle
compare a			. They have mastered the theoretical descripti	
-	and evaluate theory and ex		know corresponding measuring methods and	can
Courses (ty	vpe, number of weekly contact hour	rs, language — if other than Ge	rman)	
R + V (no i	nformation on SWS (weekl	y contact hours) and co	ourse language available)	
	assessment (type, scope, lang ditable for bonus)	guage — if other than German,	examination offered — if not every semester, information on w	hether
groups (ap project rep (approx. 3 Assessme and will be examinatio	oprox. 30 minutes per cand bort (approx. 8 to 10 pages o minutes) nt offered: When and how	didate, for modules with , time to complete: 1 to often assessment will under observance of Se	ination of one candidate each or oral examina n less than 4 ECTS credits approx. 20 minutes) 4 weeks) or d) presentation/seminar presenta be offered depends on the method of assessm ction 32 Subsection 3 ASPO (general academic	or c) ation ent
Allocation	of places			
Additional	linformation			
Workload				
Teaching o	cycle			



Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 147 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Introdu	e title			-	Abbreviation	
Introduction to Space Physics				11-ASP-092-m01		
Module coordinator			Module offered by	<u> </u>		
Managing Director of the Institute of Theoretical Physics and Astrophysics			Faculty of Physics a	nd Astronomy		
ECTS		od of grading	Only after succ. con	npl. of module(s)		
6 numerical grade						
Duratio	n	Module level	Other prerequisites			
1 semester graduate Certain sessme at the b siderec dents h the cou sessme ted to a sessme			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	s must be met to qua irer will inform stude the course. Registrat on 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 sment anew.	nts about the respen- ion for the course w hission to assessme r admission to asse will put their registra t all prerequisites w e subsequent seme-	ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-
Conten	ts	1				
6. Instr Intende The stu charge	ument ed lear idents d partie	s to measure energetic ning outcomes have basic knowledge cles in space and in th	rgetic particles in the he particles in extraterres of Space Physics, in pa e heliosphere. They kno	trial space rticular of the charac		
measu			rs, language — if other than Gei	rman)		
			ly contact hours) and co		able)	
Method	d of as		guage — if other than German,			ion on whether
a) writt	(appro	ox. 30 minutes per can	ninutes) or b) oral exam didate, for modules with s, time to complete: 1 to	n less than 4 ECTS cr	edits approx. 20 mii	
groups project (approx Assess and wil examin	x. 30 m ment c Il be an iation r	inutes) ffered: When and how	often assessment will l under observance of Sec	be offered depends of	on the method of as	esentation sessment
groups project (approx Assess and wil examin Langua	x. 30 m ment o Il be an ation r ige of a	inutes) ffered: When and how nounced in due form (egulations) 2009. ssessment: German, E	often assessment will l under observance of Sec	be offered depends of	on the method of as	esentation sessment
groups project (approx Assess and wil examin Langua	x. 30 m ment o Il be an ation r ige of a	inutes) ffered: When and how nounced in due form (egulations) 2009. ssessment: German, E	often assessment will l under observance of Sec	be offered depends of	on the method of as	esentation sessment
groups project (appro» Assess and wil examin Langua Allocat	k. 30 m ment o Il be an ation r ige of a ion of [inutes) ffered: When and how nounced in due form (egulations) 2009. ssessment: German, E	often assessment will l under observance of Sec	be offered depends of	on the method of as	esentation sessment
groups project (approx Assess and wil examin Langua Allocat	k. 30 m ment o Il be an ation r ige of a ion of [inutes) ffered: When and how nounced in due form u egulations) 2009. ssessment: German, E places	often assessment will l under observance of Sec	be offered depends of	on the method of as	esentation sessment
groups project (appro) Assess and wil examin Langua Allocat Additio 	x. 30 m ment o Il be an ation r ge of a ion of p nal inf	inutes) ffered: When and how nounced in due form u egulations) 2009. ssessment: German, E places	often assessment will l under observance of Sec	be offered depends of	on the method of as	esentation sessment
groups project (approx Assess and wil examin Langua Allocat	x. 30 m ment o Il be an ation r ge of a ion of p nal inf	inutes) ffered: When and how nounced in due form u egulations) 2009. ssessment: German, E places	often assessment will l under observance of Sec	be offered depends of	on the method of as	esentation sessment

Teaching cycle

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

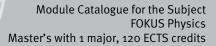
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Module appears in

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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 149 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

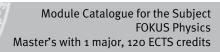
Module title					Abbreviation	
Atmosphere and Space Physics					11-AWP-092-m01	
Module coordinator			Module offered by	Ι		
Managing Director of the Institute of Theoretical Physics and Astrophysics			Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	T	od of grading	Only after succ. con	npl. of module(s)		
6	1	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	is must be met to quarer will inform stude the course. Registrat on 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 sment anew.	nts about the resp ion for the course wission to assessm r admission to ass will put their regist t all prerequisites e subsequent sem	ective details will be con- ent. If stu- essment over ration for as- will be admit- ester. For as-
Conter	nts					
	agnetos	lanetary atmospheres. spheres and interplane				
		ning outcomes				
and ne ry spac Course	ear-Eart ce miss es (type, r	number of weekly contact hour	to apply the acquired k s, language — if other than Ge	nowledge to the solu	ution of problems o	
		mation on SWS (week)	·			
		sessment (type, scope, lang ole for bonus)	guage — If other than German,	examination offered — If no	ot every semester, informa	ation on whether
groups or d) p Assess and wi examir	s (appro resenta sment o ill be an nation r	mination (approx. 90 m ox. 30 minutes per canc ation/seminar presenta offered: When and how anounced in due form u regulations) 2009. assessment: German or	lidate) or c) project rep tion (approx. 30 minut often assessment will nder observance of Se	ort (approx. 8 pages es) be offered depends (, time to complete: on the method of a	1 to 4 weeks) ssessment
Allocat	tion of	places				
Additio	onal inf	ormation				
Worklo	oad					
			_			
	no ouc	e				
Teachi	ing cyci					
		LPO I (examination regulati	ons for teaching-degree progra	ammes)		
		LPOI (examination regulati	ons for teaching-degree progra	ammes)		



Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) 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) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) Computational Mathematics (2012)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 151 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation						
Group Theory 11-GRT-092-m01						
Module coordinator			Module offered by			
Managing Director of the Institute of Theoretic and Astrophysics			Theoretical 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 met to qualify for admission to assessment. The lecturer will inform students about the respective de 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 the course of the semester, the lecturer will put their registration for sessment into effect. Students who meet all prerequisites will be added to assessment at a later date, students will have to obtain the qualification to assessment admission to assessment admission to assessment anew.			tive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-			
Conten	ts					
Group t	heory.	Finite groups. Lie group	os. Lie algebra. Depicti	on. Tensors. Classifi	cation theorem. App	lications.
Intende	ed learr	ning outcomes				
group tl	heory a	know the basics of grou and to solve them by us cessing of physical pro	ing the acquired meth			
Courses	5 (type, n	umber of weekly contact hours	, language — if other than Ge	rman)		
R + V (n	o infor	mation on SWS (weekly	r contact hours) and co	ourse language avail	able)	
		e essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
groups project (approx Assessi and will	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.					nutes) or c) esentation sessment
Allocati	-		<u> </u>			
	•					
Additio	nal inf	ormation				
Worklo	ad					
Teachin	ng cycl	e				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		
Module	appea	irs in				
Master's wit	th 1 major	FOKUS Physics (2010)		• generated 26-Aug-2024 • 6 Aaster (120 ECTS) FOKUS Phys		page 152 / 389



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) Mathematical Physics (2012)
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 with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 153 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

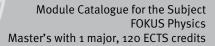
Numer	e title				Abbreviation
Numerical Methods in Astrophysics					11-NMA-092-m01
Module coordinator				Module offered by	
Managing Director of the Institute of Theoretical Physics and Astrophysics			Theoretical Physics	Faculty of Physics a	nd Astronomy
ECTS	T	od of grading	Only after succ. con	npl. of module(s)	
6	1	erical grade			
Duratio		Module level	Other prerequisites		
1 semester graduate		graduate	sessment. The lectur at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	rer will inform stude 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	alify for admission to as- nts about the respective details ion for the course will be con- hission to assessment. If stu- r admission to assessment over will put their registration for as- t all prerequisites will be admit- e subsequent semester. For as- ave to obtain the qualification fo
Conter	nte	1		Sinch ancw.	
CL). Intend	ed lear	ning outcomes			
sics wi	th the l	help of numerical simula	ations. They are especi		nd other subdisciplines of Phy- sing adequate strategies to ap-
sics wi proach	th the l such p	help of numerical simula problems and of validati	ations. They are especing the results.	ally capable of choo	
sics wi proach Course	th the l such p s (type,	help of numerical simula problems and of validati number of weekly contact hours	ations. They are especi ing the results. , language — if other than Gen	ially capable of choo	sing adequate strategies to ap-
sics wi proach Course V + Ü (i	th the l such p s (type, no info	help of numerical simula problems and of validati number of weekly contact hours rmation on SWS (weekly	ations. They are especi ing the results. , language – if other than Gen y contact hours) and co	ially capable of choo man) ourse language avail	sing adequate strategies to ap-
sics wi proach Course V + Ü (I Metho	th the l such p s (type, no info d of as	help of numerical simula problems and of validati number of weekly contact hours rmation on SWS (weekly	ations. They are especi ing the results. , language – if other than Gen y contact hours) and co	ially capable of choo man) ourse language avail	sing adequate strategies to ap-
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Module appears in

Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Mathematical Physics (2009) Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) FOKUS Physics (2010)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 155 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
Quantu	um Fiel	d Theory II			11-QFT2-092-m01	
Module	e coord	inator		Module offered by		
	ing Dire	ector of the Institute of	Theoretical Physics	Faculty of Physics a	nd Astronomy	
ECTS	<u> </u>	od of grading	Only after succ. con	npl. 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.				
Conten	its		-			
			unctionals. Path integr eaking. Effective field th		Renormalisation gro	oup. Gauge
		ning outcomes	0			
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			rs, language — if other than Ge			
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module is	s creditab	le for bonus)	guage — if other than German,			
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Additio	onal inf	ormation				
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			ions for teaching-degree progra	ammes)		
			ions for teaching-degree progra	ammes)		



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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 157 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation	
Renorm	nalizati	ion Theory			11-RNT-092-m01
Module	e coord	inator		Module offered by	
Managing Director of the Institute of The and Astrophysics			neoretical Physics	Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
6	numerical grade				
Duratio	n	Module level	Other prerequisites	i	
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 asses		
behavio levance ons. Sto berg-Ma and cor	our for e for ph ochast a diffei mparis	dynamics beyond the eq lase diagrams in cryogen ic non-linear partial diffe	uilibrium. Classical-c ic temperatures. Inst rential equations. Co etries, e.g. in the stoc	ritical and quantum- ability of statistical a nstruction of general	erential equations with scaling critical phenomena and their re- and dynamic mean-field soluti- ting functionals. Halperin-Hohen- ation (KPZ equation). Introduction
			of renormalisation g	roup methods for no	n-linear partial differential equa-
					are able to apply them to specific
Course	S (type, r	number of weekly contact hours,	language — if other than Ge	rman)	
R + V (n	io infor	mation on SWS (weekly	contact hours) and co	ourse language availa	able)
		Sessment (type, scope, langua le for bonus)	age — if other than German,	examination offered — if no	t every semester, information 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	-				
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

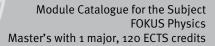
Module	e title				Abbreviation
Relativ	vistical	Quantumfield Theory	/		11-RQFT-092-m01
Module	e coord	inator		Module offered by	
Managing Director of the Institute of Theoretical Physics and Astrophysics		of Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS	Meth	od of grading	Only after succ. co	npl. of module(s)	
8 numerical grade					
		Other prerequisites	5		
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	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	I			
theory.	Feynm				and interaction. Perturbation ion. Radiative corrections and re-
normal	lisation		·····		
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Intende The stu They kr process standir Course R + V (r Method module is a) writt groups project (approx Assess and wil examin Langua Allocat 	ed lear idents now ho ses in t ng of ra s (type, r no infor d of ass s creditab cen exa (approt report x. 30 m ment o ll be an nation r age of a cion of p	ning outcomes have mastered the pr w to use perturbation the framework of qua diative corrections an number of weekly contact ho rmation on SWS (wee sessment (type, scope, la ole for bonus) mination (approx. 90 ox. 30 minutes per car (approx. 8 to 10 page inutes) offered: When and how nounced in due form regulations) 2009. Issessment: German, places	rinciples and underlying in theory and how to appl ntum electrodynamics in nd renormalisation. burs, language — if other than Ge kly contact hours) and c anguage — if other than German, minutes) or b) oral exan ndidate, for modules wit es, time to complete: 1 to w often assessment will under observance of Se	mathematics of relat y Feynman rules. The h leading order. More erman) ourse language avail examination offered — if no h less than 4 ECTS cr b 4 weeks) or d) prese be offered depends	ivistic quantum field theories. ey are able to calculate basics over, they have a basic under- 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



Module appears in

Master's with 1 major FOKUS Physic	s (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 161 / 389
		data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
Theory	of Rela	ativity			11-RTT-092-m01	
Module	e coord	inator		Module offered by		
	ing Dire	ector of the Institute of	Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS		od of grading	Only after succ. con	npl. of module(s)		
6	1	rical grade				
Duration Module level		- -	Other prerequisites			
1 seme	ster	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 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 fo		
Conten	ts	I				
ments	of diffe	rential geometry; elect		ple of a relativistic §	nmary of special relativity; ele- gauge theory; field equations o Ilation	
Intende	ed lear	ning outcomes				
mather	natical	understanding of the f		elativity on the basis	general relativity. They have a s of differential forms. They are gy.	
			s, language — if other than Ge			
R + V (r	no infor	mation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
		sessment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	ot every semester, information on whethe	
groups project (approx Assess and wil examin	(appro report x. 30 m ment o Il be an ation r	ox. 30 minutes per cano (approx. 8 to 10 pages inutes) ffered: When and how	lidate, for modules with , time to complete: 1 to often assessment will l nder observance of Sec	n less than 4 ECTS cr 4 weeks) or d) prese pe offered depends o	date each or oral examination redits approx. 20 minutes) or c entation/seminar presentation on the method of assessment 3 ASPO (general academic and	
Allocat	ion of _l	places				
Additio	onal inf	ormation				
	-					
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulation	ons for teaching-degree progra	immes)		
	ith a m - !	r FOKUS Physics (2010)	1841114/5	• generated 26-Aug-2024 •		
A DETOR'C MU	un 1 maio	FUKUS PRVSICS (2010)			exam. reg. page 162 / 3	



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Master's with 1 major FOKUS Physics (2010)

Module title				Abbreviation	
Theoretical El	ementary Particle Physic	 CS		11-TEP-092-m01	
Module coord	linator		Module offered by	ule offered by	
Managing Dire and Astrophys	ector of the Institute of Tl sics	neoretical Physics	Faculty of Physics a	and Astronomy	
	CTS Method of grading Only after succ. compl. of module(s)				
8 numerical grade					
Duration Module level Other prerequis		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		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-	
Contents	1	admission to assess	Sincht unew.		
Gauge theorie				ples of quantum field theory. . Quantum chrome dynamics. Ex-	
Intended lear	ning outcomes				
structure of th lation method	ne standard model based	on symmetry princip imple problems and p	les and experimenta processes of Elemen	Physics. They understand the Il observations. They know calcu- tary Particle Physics. Furthermo- ided theories.	
	number of weekly contact hours,				
	rmation on SWS (weekly			able)	
Method of ass module is creditab		age — if other than German,	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 cycl	e				

JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Master (120 ECTS) FOKUS Physik - 2010

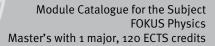
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Module appears in

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	data record Master (120 ECTS) FOKUS Physik - 2010	

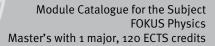
Module title				Abbreviation				
Experin	nental	Particle Physics			11-TPE-092-m01			
Module	e coord	inator		Module offered by				
Managi	ng Dire	ector of the Institute of	Applied Physics	pplied Physics Faculty of Physics and Astronomy				
ECTS	Metho	od of grading	Only after succ. con	Only after succ. compl. of module(s)				
4	nume	rical grade						
Duration 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	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							
supersy	ymmet as oth	ry and other physics be er parameters of the st	ors at the LHC and at the yond the standard mo andard model. Introduc	del. Determination o	f the top quark mass	and W mass		
Intende	ed lear	ning outcomes						
questio lysis an	ons of F Id are a	Particle Physics, which able to put results into	nciples of modern part are examined by using context and to assess t s, language — if other than Ge	these detectors. The heir systematic unce	y know modern met			
· · · · · · · · · · · · · · · · · · ·			y contact hours) and co		ahle)			
Method	d of ass		uage — if other than German,			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 inf	ormation						
Worklo	ad							
Teachir	ıg cycl	e						
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)				
Master's wi	th 1 majo	FOKUS Physics (2010)		; • generated 26-Aug-2024 • 6 Aaster (120 ECTS) FOKUS Phys	-	page 166 / 389		



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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 167 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	1

Module title				Abbreviation		
Particle	Physi	cs (Standard Model)			11-TPS-092-m01	
Module	coord	inator		Module offered by		
Managing Directors of the Institute of the Institute of Theoretical Physics and						
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		sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se 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		-			
		o the theory of electrow el and determination of		ontaneous symmetry	y breaking. Experime	ents on the
Intende	d learr	ning outcomes				
perimer	nts tha	know the theoretical fur t have established and sults in the framework o	confirmed the standar	d model. They are al	ole to interpret expe	
Courses	5 (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	ourse language availa	able)	
		s essment (type, scope, langu le for bonus)	uage — if other than German, e	examination offered — if no	t every semester, informat	ion on whether
groups project (approx Assessi and will examin	(appro report 3. 30 m ment o l be an ation re	nination (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	idate, for modules with time to complete: 1 to often assessment will b nder observance of Sec	1 less than 4 ECTS cr 4 weeks) or d) prese pe offered depends c	edits approx. 20 mir entation/seminar pre on the method of ass	nutes) or c) esentation sessment
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachin	ig cycl	9				
Referre	d to in	LPOI (examination regulatio	ns for teaching-degree progra	mmes)		
Master's wit	th 1 major	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e aster (120 ECTS) FOKUS Phys	-	page 168 / 389



Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 169 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Master's with 1 major FOKUS Physics (2010)

Module title				Abbreviation
Supersymm	etry I and II			11-SUS-092-m01
Module cooi	dinator		Module offered by	<u>I</u>
Managing Director of the Institute of Theoretical Physics and Astrophysics		Faculty of Physics a	and Astronomy	
ECTS Met	hod of grading	Only after succ. con	npl. of module(s)	
6 num	erical grade			
Duration	Module level	Other prerequisites		
1 semester	graduate	sessment. The lectur at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i	rer will inform stude the course. Registrat n of will to seek adn d the qualification for mester, the lecturer t. Students who mee n the current or in th date, students will h	alify for admission to as- ents about the respective details tion for the course will be con- nission to assessment. If stu- or admission to assessment over will put their registration for as- et all prerequisites will be admit- te subsequent semester. For as- nave to obtain the qualification for
Contents		admission to assess	sment anew.	
persymmetry Supersymmetry	y: Algebra and multiplets. etry II: Minimal supersymm	Superfield formalism netric standard mode	. Breaking of supers I. Higgs sector. The s	ppuszanski-Sohnius theorem. Su- ymmetry. spectrum of supersymmetric par- s models. Violation of R-parity.
Intended lea	rning outcomes			
tric models.		ry's formalism and re		ipersymmetry and supersymme- ons to other models as well as its
Courses (type	, number of weekly contact hours,	language — if other than Gei	rman)	
V + R (no inf	ormation on SWS (weekly	contact hours) and co	ourse language avail	able)
Method of a module is credit		age — if other than German,	examination offered — if no	ot every semester, information on whether
groups (app project repo (approx. 30 Assessment and will be a examination	rox. 30 minutes per candic rt (approx. 8 to 10 pages, t minutes) offered: When and how of	date, for modules with time to complete: 1 to ften assessment will l der observance of Sec	n less than 4 ECTS cr 4 weeks) or d) prese pe 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
Allocation o	f places			
Additional in	formation			
Workload				
Teaching cy	cle			

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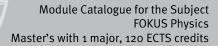


Module appears in

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	data record Master (120 ECTS) FOKUS Physik - 2010	

Modul	e title				Abbreviation
Theore	tical A	strophysics			11-AST-092-m01
Modul	e coord	inator		Module offered by	
-	ing Dir trophy	ector of the Institute o sics	f Theoretical Physics	Faculty of Physics	and Astronomy
ECTS	Meth	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			
Conter	nts	10	,		
Theore	tical As	trophysics, models fo	or the description of com	plex observation re	sults, numeric simulations.
		ning outcomes			· · ·
			e of the methods of Theo	pretical Astrophysics	. They are able to design complex
			s with the help of simula		
Course	S (type, 1	number of weekly contact ho	urs, language — if other than Ge	rman)	
R + V (I	no infoi	mation on SWS (weel	kly contact hours) and c	ourse language avai	lable)
		Sessment (type, scope, lan ble for bonus)	nguage — if other than German,	examination offered — if n	ot every semester, information on whether
	-	nation (approx. 120 m	inutes)		
	tion of				
Additio	onal inf	ormation			
Worklo	ad				
	-				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regula	tions for teaching-degree progr	ammes)	
				-	
Modul	e appea	ars in			
		ree (1 major) Physics	(2010)		
	-	ree (1 major) Physics			
	-	ree (1 major) Mathem			
	-	ree (1 major) Mathem	• •		
	-	ee (1 major) Physics (2	•		
	-	ee (1 major) Physics (2			
		ee (1 major) Mathema			
Master	-				
	's degr	ee (1 major) FOKUS Pł	nysics (2010)		
Master	-	ee (1 major) FOKUS Pł ee (1 major) FOKUS Pł	· · ·		

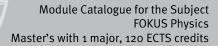
Module	e title				Abbreviation	
Strong	Intera	tion in Accelerator Ex	periments		11-WWB-102-m01	
Module	e coord	inator		Module offered by	1	
Managing Director of the Institute of Applied Physics			Applied Physics	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. co	• • • • • • • • • • • • • • • • • • • •		
3	nume	rical grade				
Duratio	on	Module level	Other prerequisite	s		
1 seme	ster	graduate	sessment. The lect at the beginning of sidered a declarati dents have obtaine the course of the s sessment into effe ted to assessment	es must be met to qu urer will inform stude the course. Registrat on of will to seek adn ed the qualification fo emester, the lecturer ct. Students who mee in the current or in th r date, students will h ssment anew.	nts about the respe- tion for the course we hission to assessme or admission to asse will put their registra et all prerequisites we e subsequent seme	ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as-
Conten	ts					
Asympt	tomatic QCD Jei	freedom/confinement simulation. Hadron p				
Intende	ed lear	ning outcomes				
	nts. Th	know the basic organis ey have knowledge of i				
Course	S (type, r	umber of weekly contact hour	rs, language — if other than G	erman)		
V + R (n	no infor	mation on SWS (weekl	y contact hours) and c	ourse language avail	able)	
		essment (type, scope, lang le for bonus)	guage — if other than German	, examination offered — if no	ot every semester, informat	ion on whether
groups project (approx Assessi and wil examin	(appro report x. 30 m ment o Il be an ation r	nination (approx. 90 n x. 30 minutes per cand (approx. 8 to 10 pages inutes) ffered: When and how nounced in due form u egulations) 2009. ssessment: German, E	lidate, for modules wi , time to complete: 1 t often assessment will inder observance of Se	th less than 4 ECTS cr o 4 weeks) or d) prese be offered depends	edits approx. 20 min entation/seminar pro on the method of as	nutes) or c) esentation sessment
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ng cycl	9				
Referre	d to in	LPO I (examination regulati	ons for teaching-degree prog	rammes)		



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

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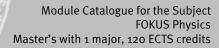
Module	e title				Abbreviation	
Practic	al Cou	rse Astrophysics			11-APP-111-m01	
Module	Module coordinator			Module offered by		
Managing Director of the Institute of Theoretical Physics and Astrophysics			Faculty of Physics a	and Astronomy		
ECTS		od of grading	Only after succ. con	npl. of module(s)		
6 (not) successfully completed						
Duratio	on	Module level	Other prerequisites	5		
1 seme	ester	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 emester, 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 registra et all prerequisites we e subsequent seme	ctive details ill be con- nt. If stu- ssment over ation for as- rill be admit- ster. For as-
Conten	Its		1			
Astropł tions.	hysical	experiments in the field	ds of detectors, telesco	opes, methodology,	analysis and astrono	omic observa-
Intende	ed lear	ning outcomes				
and wit ons and Course	th basi d meas s (type, r	ta and present the resu c techniques of detectin surements and to prese number of weekly contact hours tion on SWS (weekly co	ng electromagnetic rad nt the results. s, language — if other than Ge	liation. They are able	to plan and evaluat	
Method	d of ass	sessment (type, scope, lang ble for bonus)				ion on whether
(exam) test the nutes). Assess and wil	is pass e candi ment o ll be an	performing and evaluat sed. Experiments that w date's understanding o offered: When and how o inounced in due form u regulations) 2009.	vere not successfully co f the physics-related c often assessment will	ompleted can be rep ontents and results o be offered depends o	eated once. Or b) di of the experiment (a on the method of as	scussion to pprox. 20 mi- sessment
Allocat	ion of _l	places				
Additio	onal inf	ormation				
Worklo	ad					
 Teachir		A				
	ing tytt	~				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		
Master's wi	ith 1 majo	r FOKUS Physics (2010)	-	g • generated 26-Aug-2024 • Master (120 ECTS) FOKUS Phy:	-	page 175 / 389



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	data record Master (120 ECTS) FOKUS Physik - 2010	

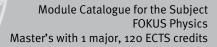
Module title				Abbreviation		
Particle	Particle Radiation Detectors				11-DTS-111-m01	
Module	e coord	inator		Module offered by		
Managi	ng Dire	ector of the Institute of A	pplied Physics	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	Only after succ. compl. of module(s)		
4 numerical grade						
Duratio	n	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 sessment into effec 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					
		nteraction between part omentum, energy and p				
Intende	ed lear	ning outcomes				
and ap	plicatio	know the physical princi ons of different types of lge of the conception of	detectors, they can ex			
Course	S (type, r	number of weekly contact hours,	language — if other than Ger	rman)		
V + Ü (r	no infor	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)	
		sessment (type, scope, langu le for bonus)	age — if other than German,	examination offered — if no	t every semester, informat	ion on whether
groups project (approx Assess and wil examin	(appro report <. 30 m ment o l be an ation r	mination (approx. 90 mi x. 30 minutes per candi (approx. 8 to 10 pages, inutes) ffered: When and how o nounced in due form un egulations) 2009. ssessment: German, En	date, for modules with time to complete: 1 to ften assessment will h der observance of Sec	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 as:	nutes) or c) esentation sessment
Allocat	-		5			
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulation	ns for teaching-degree progra	immes)		
Module	e appea	ars in				
Master's wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 177 / 389



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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 178 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
Moder	n Astro	physics			11-MAS-111-m01	
Module	e coord	inator		Module offered by		
	ing Dire	ector of the Institute of	Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS						
4	1	rical grade		•		
Duration Module level Other prerequisites						
1 seme	ster	graduate	sessment. The lectu at the beginning of sidered a declaration dents have obtaine the course of the se sessment into effect ted to assessment i	trer will inform stude the course. Registrat on of will to seek adn d the qualification for mester, the lecturer t. Students who mee n the current or in th date, students will h	alify for admission to as- ents about the respective details tion for the course will be con- nission to assessment. If stu- or admission to assessment over will put their registration for as- et all prerequisites will be admit- te subsequent semester. For as- nave to obtain the qualification fo	
Conten	its		•			
Introdu	iction t	o a field of modern Ast	rophysics, e.g. extra-ga	lactic jets.		
Intend	ed lear	ning outcomes				
lues ar observ	nd are t ational	o plan and conduct ob project and e.g. to app	servations in this area. Ily for observation time	This includes the ab at large telescopes.	ysics. They know the physical va- ility to conceptualise a specific	
	-	number of weekly contact hour				
		mation on SWS (weekl	·	<u> </u>	· · · · · · · · · · · · · · · · · · ·	
		Sessment (type, scope, lang ble for bonus)	uage — if other than German,	examination offered — if no	ot every semester, information on whether	
groups project (approz Assess and wil examin	(appro report x. 30 m ment o Il be an nation r	ox. 30 minutes per canc (approx. 8 to 10 pages inutes) ffered: When and how	lidate, for modules wit , time to complete: 1 to often assessment will nder observance of Se	h less than 4 ECTS cr 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	
Allocat	ion of	places				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)		
Module	e appea	ars in				
Master's w	ith 1 majo	r FOKUS Physics (2010)		• generated 26-Aug-2024 •		
			data record N	Aaster (120 ECTS) FOKUS Phys	sik - 2010	



Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 180 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
Introdu	iction t	o Elementary Particle	Theory		11-ETT-111-m01	
Module	e coord	inator		Module offered by		
Managi and Asi		ector of the Institute o	f Theoretical Physics	Faculty of Physics a	and Astronomy	
ECTS		od 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		sessment. The lectu at the beginning of sidered a declaration dents have obtained the course of the se sessment into effec 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					
			rk model of hadrons. Fe el. Parton model and dec			um electro-
		ning outcomes				
			dge of Theoretical Eleme	entary Particle Physic		
Course	S (type, r	number of weekly contact hou	ırs, language — if other than Ge	rman)		
V (no ir	nformat	tion on SWS (weekly c	ontact hours) and cours	e language available	2)	
		sessment (type, scope, lar le for bonus)	nguage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
groups project (approx Assess and wil examin	(appro report x. 30 m ment o Il be an ation r	x. 30 minutes per can (approx. 8 to 10 page inutes) ffered: When and how	minutes) or b) oral exam didate, for modules with s, time to complete: 1 to v often assessment will under observance of Se English	n less than 4 ECTS cr 4 weeks) or d) prese be 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 regula	tions for teaching-degree progra	ammes)		
		•				
Module						
Master	s degr	ee (1 major) Physics (2	2010)			
Naster's wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e Aaster (120 ECTS) FOKUS Phys	-	page 181 / 389

Julius-Maximilians-UNIVERSITÄT WÜRZBURG



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

		- / -
Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 182 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	
	data lecolu Master (120 ECT3) TOROS Physik - 2010	

4 numerical grade - Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The teuturer will inform students about the respective detail at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If stuudents have obtained the qualification for admission to assessment into the course of the semester, the lecturer will put their registration for assessment into the fetc. Students who meet all prerequisites will be admited to assessment into the fetc. Students who meet all prerequisites will be admited to assessment into the fetc. Students who meet all prerequisites will be admited to assessment in the current or in the subsequent semester. For assessment into the fetc. Students who meet all prerequisites will be admited to assessment into the subsequent semester. For assessment into the fetc. Students who meet all prerequisites are quantum reduced graphs, so-called spin networks. In doing so, e.g. a quantisation of elemental vables are identified with the corresponding Poisson brackets. These variables are quantised in the typical manion of discretised graphs, so-called spin networks. In doing so, e.g. a quantisation of space and time intended learning outcomes The students know the principles of quantum loop gravity. They have acquired advanced knowledge of a selected topic and have proved their knowledge in a seminar presentation. Courses (new, number of weekly contact hours, language – I other than German) V + S (no information on SWS (weekly contact hours) and course language available) Method of assessesment (type, scope, language – I other than German)<	Module	e title				Abbreviation	
Managing Director of the institute of Theoretical Physics Faculty of Physics and Astronomy ECTS Method of grading Only after succ. compl. of module(s) A numerical grade - Duration Module level Other prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective detail 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 into effect. Students who meet all prerequisites will be admission to assessment into effect. Students who meet all prequegisites will be admission to assessment into effect. Students who meet all prequegisites will be admission to assessment into effect. Students who meet all prequegisites will be admission to assessment into effect. Students who meet all prequegisites will be admission to assessment at a later date, students will have to obtain the qualification admission to assessment as a sessment as later date, students will have to obtain the qualification and on discretised graphs, so-called spin networks. In doing so, e.g. a quantisation of elemental volumes appears Therefore, QLG belongs to the speculative theories which paint a picture of the constitution of space and time intended learning outcomes The students know the principles of quantum loop gravity. They have acquired advanced knowledge of a selected topic and have proved their knowledge in a seminar presentation. Coursed (type, number of weekly contact hours), anguage – if other than German, examination of fered A stro information on SWS (weekly contact hours) and course language av	Quantu	ım Loo	p Gravity			11-QSG-102-mo	1
Managing Director of the institute of Theoretical Physics Faculty of Physics and Astronomy ECTS Method of grading Only after succ. compl. of module(s) A numerical grade - Duration Module level Other prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective detail 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 into effect. Students who meet all prerequisites will be admission to assessment into effect. Students who meet all prequegisites will be admission to assessment into effect. Students who meet all prequegisites will be admission to assessment into effect. Students who meet all prequegisites will be admission to assessment into effect. Students who meet all prequegisites will be admission to assessment at a later date, students will have to obtain the qualification admission to assessment as a sessment as later date, students will have to obtain the qualification and on discretised graphs, so-called spin networks. In doing so, e.g. a quantisation of elemental volumes appears Therefore, QLG belongs to the speculative theories which paint a picture of the constitution of space and time intended learning outcomes The students know the principles of quantum loop gravity. They have acquired advanced knowledge of a selected topic and have proved their knowledge in a seminar presentation. Coursed (type, number of weekly contact hours), anguage – if other than German, examination of fered A stro information on SWS (weekly contact hours) and course language av	Module	e coord	inator		Module offered by		
ECTS Method of grading Only after succ. compl. of module(s) numerical grade Duration Module level Other prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective detail at the beginning of the course. Registration for the course will be considered a declaration of will to ease admission to assessment. If students have obtained the qualification for admission to assessment will be considered a declaration of will to ease admission to assessment. If students have obtained the qualification for admission to assessment into effect. Students who meet all prerequisites will be admitted to assessment and the subsequent semester. For assessment at a later date, students will have to obtain the qualification admission to assessment. The lecturer will precursities will be admitted to assessment anew. Contents	Managi	ing Dire	ector of the Institute o	f Theoretical Physics		and Astronomy	
4 numerical grade Duration Module level Other preequisites Duration Module level Other preequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective detail at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment on the feet. Students who meet all preequisites will be admited the course of the semester, the lecturer will put their registration for assessment in the feet. Students who meet all preequisites will be admited to assessment in the feet. Students who meet all preequisites will be admited to assessment at a later date, students will have to obtain the qualification admission to assessment at a later date, students will have to obtain the qualification admission to assessment at a later date, students will have to obtain the qualification admission to assessment. QLG belongs to the speculative theories which paint a picture of the constitution of space and time interfore, QLG belongs to the speculative theories which paint a picture of the constitution of space and time interfore. QLG belongs to the speculative theories which paint a picture of the constitution of space and time interfore, QLG belongs to the speculative theories which paint a picture of the constitution of space and time interfore. QLG belongs to the speculative theories which paint a picture of the constitution of space and time interfore. QLG belongs to the speculative theories which paint a picture of the constitution of space and time interfore. QLG belongs to the speculative theories which paint a picture of the constitution of space and time interfore. QLG belongs to the spece interfore a semination of grave acquired advanced knowledge of a selected topic and have proved threir knowledge in a seminar pr	ECTS			Only after succ. con	npl. of module(s)		
Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective detail 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. If students have obtained the qualification for admission to assessment or the course of the semester, the lecturer will put their registration for assessment at a later date, students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification admission to assessment. The successful description of gravity. General relativity is formulated in Hamiltonian formalism and the elemental values are identified with the corresponding Poisson brackets. These variables are quantised in the typical mann on discretised graphs, so-called spin networks. In doing so, e.g. a quantisation of elemental volumes appears Therefore, QLG belongs to the speculative theories which paint a picture of the constitution of space and time Intended learning outcomes The students know the principles of quantum loop gravity. They have acquired advanced knowledge of a selected topic and have proved their knowledge in a seminar presentation. Courses (type, number of weekly contact hours. Janguage – if other than German) V + s (no information on SWS (weekly contact hours.) and course language available) Method of assessment (percey, sope, language – if other than German) V + s (no information of aprox. 9 o minutes) or b) oral e	4	nume	rical grade		· · · · ·		
sessment. The lecturer will inform students about the respective detail 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 on the course of the semester, the lecturer will put their registration for as sessment into effect. Students who meet all prerequisites will be admited to assessment into effect. Students will have to obtain the qualification admission to assessment and the description of gravity. General relativity is formulated in Hamiltonian formalism and the elemental vables are identified with the corresponding Poisson brackets. These variables are quantised in the typical mam on discretised graphs, so-called spin networks. In doing so, e.g. a quantisation of elemental volumes appears Therefore, QLG belongs to the speculative theories which paint a picture of the constitution of space and time intended learning outcomes The students know the principles of quantum loop gravity. They have acquired advanced knowledge of a selected topic and have proved their knowledge in a seminar presentation. Courses (type, number of weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German) V + S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German) V = S (no information 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 b) oral examination (approx. 90 minutes) or c) project report (approx. 18 to 10 pages, time				Other prerequisites	;		
Aside from string theory, quantum loop gravity (QLG) is one of the most important approaches to a quantum m chanical description of gravity. General relativity is formulated in Hamiltonian formalism and the elemental va bles are identified with the corresponding Poisson brackets. These variables are quantised in the typical mann on discretised graphs, so-called spin networks. In doing so, e.g. a quantisation of elemental volumes appears Therefore, QLG belongs to the speculative theories which paint a picture of the constitution of space and time Intended learning outcomes The students know the principles of quantum loop gravity. They have acquired advanced knowledge of a select ted topic and have proved their knowledge in a seminar presentation. Courses (type, number of weekly contact hours, language – if other than German) V + S (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 whethe 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. 30 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) Language of 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. Allocation of places 	1 seme	ster	graduate	sessment. The lectu at the beginning of sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment in sessment at a later	trer will inform stude the course. Registrat on of will to seek adn d the qualification for mester, the lecturer t. Students who mee n the current or in th date, students will h	nts about the res ion for the cours nission to assess r admission to a will put their reg t all prerequisite e subsequent se	spective details e will be con- sment. If stu- ssessment over istration for as- es will be admit- mester. For as-
Aside from string theory, quantum loop gravity (QLG) is one of the most important approaches to a quantum m chanical description of gravity. General relativity is formulated in Hamiltonian formalism and the elemental va bles are identified with the corresponding Poisson brackets. These variables are quantised in the typical mann on discretised graphs, so-called spin networks. In doing so, e.g. a quantisation of elemental volumes appears Therefore, QLG belongs to the speculative theories which paint a picture of the constitution of space and time Intended learning outcomes The students know the principles of quantum loop gravity. They have acquired advanced knowledge of a select ted topic and have proved their knowledge in a seminar presentation. Courses (type, number of weekly contact hours, language – if other than German) V + S (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 whethe 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. 30 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) Language of 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. Allocation of places 	Conten	ts					
V + S (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) Language of assessment: German, English 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. Allocation of places Morkload Morkload Morkload Teaching cycle Morkload Morkload Mutric pr	Therefo Intende The stu ted top	ore, QLO ed lear idents ic and	G belongs to the speci ning outcomes know the principles of have proved their kno	ulative theories which p quantum loop gravity. wledge in a seminar pre	aint a picture of the o They have acquired a esentation.	constitution of sp	bace and time.
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) Language of assessment: German, English 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. Allocation of places Morkload Teaching cycle Itaster's with 1 major FOKUS Physics (2010)			· · · · · · · · · · · · · · · · · · ·			able)	
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) Language of assessment: German, English 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. Allocation of places 				nguage — if other than German,	examination offered — if no	ot every semester, info	rmation on whether
Additional information Workload Teaching cycle Master's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 183 / 3	b) oral module c) proje d) pres Langua Assess and wil	examir es with ect repo entatic age of a ment o Il be an	nation of one candidat less than 4 ECTS cred ort (approx. 8 to 10 pa n/seminar presentati ssessment: German, I ffered: When and how nounced in due form	te each or oral examinat its approx. 20 minutes) ges, time to complete: 1 on (approx. 30 minutes) English v often assessment will	or to 4 weeks) or be offered depends o	on the method of	fassessment
	Allocat	ion of _l	olaces				
Teaching cycle Naster's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 183 / 3	Additio	nal inf	ormation				
Teaching cycle Naster's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 183 / 3							
Aster's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 183 / 3	Worklo	ad					
Aster's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 183 / 3							
	Teachir	ng cycl	e				
	Master's wi	ith 1 majo	r FOKUS Physics (2010)	-		-	page 183 / 389

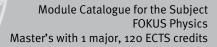
Referred to in LPO I (examination regulations for teaching-degree programmes)

Module appears in

Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 184 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

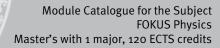
Module	e title				Abbreviation		
Concep	ots of T	heoretical Astroparticl	e physics		11-ATT-111-m01		
Module	e coord	inator		Module offered by	l		
	ing Dir	ector of the Institute of	Theoretical Physics				
ECTS		od of grading	Only after succ. con	only after succ. compl. of module(s)			
4		rical grade					
Duratio		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						
		heoretical Astro-Particl ors, dark energy, inflati	e Physics, e.g. Dark ma on.	tter, cosmic radiatio	n, neutrinos, baryog	enesis, cos-	
		ning outcomes					
be phe	nomen		of the concepts of Thec ics on the basis of metl				
Course	S (type, 1	number of weekly contact hour	s, language — if other than Ge	rman)			
V + R (r	no info	rmation on SWS (weekl	y contact hours) and co	ourse language avail	able)		
		S essment (type, scope, lang ole for bonus)	guage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether	
groups project (approx Assess and wil	(appro report x. 30 m ment o Il be an	ox. 30 minutes per cano (approx. 8 to 10 pages inutes) Iffered: When and how	ninutes) or b) oral exam lidate, for modules with , time to complete: 1 to often assessment will l nder observance of Sec	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	ion of	places					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	immes)			
 Module	e appea	ars in					
			Module appears in Master's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 185 / 389				



Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 186 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	ĺ

Module	title				Abbreviation	
General	l Theor	y of Relativity			11-ART-112-m01	
Module	coord	inator		Module offered by		
Managii and Ast		ector of the Institute of sics	Theoretical Physics	Faculty of Physics a	nd Astronomy	
		od of grading	Only after succ. con	Only after succ. compl. of module(s)		
4	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i		
1 semes	ster	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 fo		
Content	ts					
ments o	of diffe	rential geometry; elect	eory of relativity; differe rodynamics as an exan roduction to cosmology	nple of a relativistic g	auge theory; field e	
		ning outcomes				
mathem able to a	natical apply t	understanding of the he acquired knowledg	nsic physical and mather formulation of general r ge to problems of Astrop rs, language — if other than Ge	elativity on the basis physics and cosmolo	s of differential form	
			ly contact hours) and co		able)	
Method	of ass		guage — if other than German,			ion on whether
groups (project) (approx Assessn and will	(appro report 30 m nent o l be an	x. 30 minutes per cane (approx. 8 to 10 pages inutes) ffered: When and how	ninutes) or b) oral exam didate, for modules with t, time to complete: 1 to often assessment will under observance of Se	h less than 4 ECTS cr 4 weeks) or d) prese be offered depends o	edits approx. 20 min entation/seminar properties on the method of as	nutes) or c) esentation sessment
Allocati	on of p	olaces				
Addition	nal inf	ormation				
	he					
Workloa	au					
Workloa						
Workloa Teachin		e				
 Teachin 	ıg cycl					
 Teachin 	ıg cycl		ions for teaching-degree progra	ammes)		
 Teachin 	ıg cycl		ions for teaching-degree progra	ammes)		

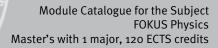


Module appears in

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) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 188 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	1

Module	e title				Abbreviation	
Specia	l Theor	y of Relativity			11-SRT-112-m01	
Module	e coord	inator		Module offered by		
	ing Dire	ector of the Institute of	Theoretical Physics			
ECTS	T Ó	od of grading	Only after succ. con	npl. 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 fo admission to assessment anew.			
Conten	ts					
		principles; differentia of motion; relativistic		y; Minkowski space	; Lorentz transformation, Hamilto	
		ning outcomes				
familia ge to p	r with r roblem	nodern mathematical f s of special relativity.d	formulation of special released	elativity. They are ab	es of special relativity. They are le to apply the acquired knowled	
	-		rs, language — if other than Ge			
-		· · · · · · · · · · · · · · · · · · ·	ly contact hours) and co	<u>v v</u>	•	
		S essment (type, scope, lang ble for bonus)	guage — if other than German,	examination offered — if no	ot every semester, information on whether	
groups project (approx Assess and wil	(appro report x. 30 m ment o Il be an	ox. 30 minutes per cano (approx. 8 to 10 pages inutes) iffered: When and how	didate, for modules with , time to complete: 1 to often assessment will	n less than 4 ECTS cr 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	
Allocat	ion of _l	places				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ing cycl	e				
Referre	d to in	IPOI (overnination regulation	ions for teaching-degree progra	ummoc)		
			ions for teaching-degree progra			
Module	e appez	ars in				
Master's w	ith 1 majo	r FOKUS Physics (2010)	JMU Würzburg	• generated 26-Aug-2024 •	exam. reg. page 189 / 389	



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) 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 190 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	



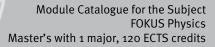
Complex Systems, Quantum Control and Biophysics

(24 ECTS credits)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 191 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title					Abbreviation	
Nano-O	ptics				11-NOP-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	npl. of module(s)		
4	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i 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	ts					
		inciples. Focussing of li ters. Light emission in				y. Single
Intende	ed learı	ning outcomes				
		nave specific and adva les and application are				th the theo-
Course	S (type, n	umber of weekly contact hours	s, language — if other than Ge	rman)		
R + V (n	o infor	mation on SWS (weekly	/ contact hours) and co	ourse language availa	able)	
		essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
groups project (approx Assess and wil examin	(appro report k. 30 m ment o l be an ation 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, Ei	idate, for modules with time to complete: 1 to often assessment will nder observance of Sec	n less than 4 ECTS cr 4 weeks) or d) prese be offered depends c	edits approx. 20 mir entation/seminar pre on the method of ass	nutes) or c) esentation sessment
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Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module						
Bachel	or' deg	ree (1 major) Physics (2	010)			
Master's wi	th 1 majoı	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e Naster (120 ECTS) FOKUS Phys	-	page 192 / 389

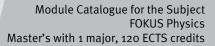
Julius-Maximilians-UNIVERSITÄT WÜRZBURG



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 Science					11-BMT-092-m01	
Module coordinator				Module offered by		
Managing Director of the Institute of Applied Physics			Applied Physics	Faculty of Physics and Astronomy		
ECTS		od of grading	Only after succ. con		ind / Scienciny	
6	1	rical grade				
Duratio		Module level	Other prerequisites			
1 seme	ster	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	ts					
topics a sound image	are con and MF process		ue, computer tomogra	phy, imaging technic	ques of nuclear med	icine, ultra-
		ning outcomes				
	nd the p	know the physical princ principles of image gen				
Course	S (type, r	umber of weekly contact hours	s, language — if other than Ger	rman)		
R + V (r	no infor	mation on SWS (weekly	y contact hours) and co	ourse language avail	able)	
		essment (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 x. 30 m ment o Il be an action r	mination (approx. 90 m x. 30 minutes per cand (approx. 8 to 10 pages, inutes) ffered: When and how nounced in due form u egulations) 2009. ssessment: German, Ei	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	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 regulation	ons for teaching-degree progra	immes)		
Master's wi	ith 1 majo	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 194 / 389
					2010	





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 (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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 195 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Master's with 1 major FOKUS Physics (2010)

Laboratory and Measurement Technology in Biophysics 11-LMB-092-m01 Module coordinator Module offered by Managing Director of the Institute of Applied Physics Faculty of Physics and Astronomy ETTS Method of grading Only after succ. compl. of module(s) 6 numerical grade - Duration Module level Other prerequisites must be met to qualify for admission to assessment. The locturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. Ifsu due the qualification for admission to assessment into effect. Students who meet all prerequisites will be considered a declaration of will to seek admission to assessment into effect. Students who meet all prerequisites will be admited by physical principles of biological systems. The heater will home tall prerequisites will be admited admission to assessment into effect. Students who meet all prerequisites will be admited a declaration of biological systems. The main topics are optical measuing techniques and smorp, methods of single-particle detection, special microscoping techniques and methods of single-particle detection, special microscoping techniques and methods of single-particle detection, special microscoping techniques and method of assessment. The locus well as the physical principles of biological systems. They have knowledge of optical measuing techniques and their applications of a admission to assessment well as the physical principles of biological systems. They have knowledge of optical measuing techniques and their applications and are able to apply techniques of structure elucidation to simplibiomolecule	Module title Abbreviation					
Managing Director of the institute of Applied Physics Faculty of Physics and Astronomy ECTS Method of grading Only after succ. compl. of module(s) 6 numerical grade Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment. If sudents who meet all prerequisites will be admitted to assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification f admission to assessment areasuring techniques and sensors, methods of single-particle detection, special microscoping techniques and methods of structure elucidation of biomolecules. Intended learning outcomes The students know the principles of molecular and cellular biology as well as the physical principles of biophysical principles of molecular and are able to apply techniques of structure elucidation to simple biomolecules. Courses (yee, number of weekly contact hours, language — if other than German) R + V (no information on SWS (weekly contact hours) and course language available) Method to assessment type, scope, language — if other than German, examination of one candidate each or oral examination	aboratory and Measurement Technology in Biophysics 11-LMB-092-mo1					
ECTS Method of grading Only after succ. compl. of module(s) 6 numerical grade Duration Module level Other prerequisites 1 semester graduate Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment as sessment in the current or in the subsequent semester. For assessment in the current or in the subsequent semester. For assessment in the current or in the subsequent semester. For assessment in the current or in the subsequent semester. For assessment in the current or in the subsequent semester. For assessment in the current or in the subsequent semester. For assessment incellular biology as well as the physical principles of bio physical procedures for the examination and manipulation of biological systems. The main topics are optical measuring techniques and sensors, methods of single-particle detection, special microscoping techniques and methods of structure elucidation on simplications and are able to apply techniques of structure elucidation to simplibiomolecules. Courses (type, number of weekly contact hours, language – if other than Geman) R + V (no information on SWS (weekly contact hours) and course language available) Method of seessment (spee, scope, language – if other than Geman, examination of one candidate each or onal examination of gone candidate, for modules with less than 4 ECTS credits approx	Module coordinator Module offered by					
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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 in the course of the semester, the lecturer will put their registration for as- sessment in the orternet 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 The lecture covers relevant principles of molecular and cellular biology as well as the physical principles of bio- physical procedures for the examination and manipulation of biological systems. The main topics are optical measuring techniques and sensors, methods of single-particle detection, special microscoping techniques and methods of structure elucidation of biomolecules. Intended learning outcomes Intended learning outcomes Rev (moleres for the examination and manipulation of biological systems. They have knowledge of optical measuring techniques and their applications and are able to apply techniques of structure elucidation to simpl biomolecules. 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 of one candidate each or oral examination in groups (approx. 30 minutes) or b) oral examination of one candidate each or oral	ECTS Method of grading					
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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 Morkload 	neasuring techniques and sense nethods of structure elucidation ntended learning outcomes The students know the principles sical procedures for the examination neasuring techniques and their	ors, methods of single-pa of biomolecules. s of molecular and cellul tion and manipulation o	article detection, speci ar biology as well as th f biological systems. T	al microscoping techniques and ne physical principles of biophy- hey have knowledge of optical		
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	Additional information					
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Teaching cycle	Workload					
Teaching cycle	-					
	Feaching 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 - 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)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 197 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation		
Physics of C	omplex Systems		11-PKS-092-m01		
Module coordinator			Module offered by		
Managing Di and Astroph	rector of the Institute of Th ysics	eoretical Physics	Faculty of Physics a	nd Astronomy	
ECTS Met	nod of grading	Only after succ. com	pl. of module(s)		
6 num	erical grade				
Duration	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 set sessment into effect ted to assessment in	rer will inform stude the course. Registrat n of will to seek adm the qualification fo mester, the lecturer t. Students who mee n the current or in the date, students will h	alify for admission to as- nts about the respective details ion for the course will be con- sission to assessment. If stu- r admission to assessment over will put their registration for as- t all prerequisites will be admit- e subsequent semester. For as- ave to obtain the qualification for	
Contents					
 2. Introducti 3. Entropy pl 4. Phase trans 5. Universali 6. Spin glass 		equilibriumt t			
	Intended learning outcomes				
The students methods of s	have specific and advance	tational Physics and I	non-linear dynamics	omplex systems. They know the , which are used to describe	
Courses (type	, number of weekly contact hours, I	anguage — if other than Ger	man)		
R + V (no inf	ormation on SWS (weekly o	contact hours) and co	ourse language availa	able)	
Method of a module is credit		ge — if other than German, e	examination offered — if no	t every semester, information on whether	
groups (app project repo (approx. 30 Assessment and will be a examination	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 in	Iformation				
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) 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)

Master's with 1 major FOKUS Physics (2010)

Module	e title				Abbreviation
Quantu	Quantum Information and Quantum Computing 11-QIC-092-m01				
Module	e coord	inator		Module offered by	l
	ing Dire trophys	ector of the Institute of T sics	heoretical 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		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	rer will inform stude the course. Registrat n of will to seek adn d the qualification fo mester, the lecturer t. 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- or 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	its				
tron sp states. Intende	in state ed leari idents l	es. The third part covers	the description and e	xplanation of decon theory and basic kn	ipulation of coherent two-elec- erence of quantum mechanical owledge of quantum calculation
-		number of weekly contact hours,		•	
		mation on SWS (weekly			able)
Metho	d of ass				ot every semester, information on whether
groups project (approx Assess and wil examin	(appro report x. 30 m ment o Il be an	x. 30 minutes per candi (approx. 8 to 10 pages, inutes) ffered: When and how o	date, for modules with time to complete: 1 to ften assessment will I der observance of Sec	n less than 4 ECTS cr 4 weeks) or d) prese pe offered depends o	date 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	ion of p	olaces			
Additio	onal inf	ormation	_		
Worklo	ad				
 Teachiı	ng cycl	e			

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

Module appears in

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Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 201 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module t	tle			Abbreviation			
Statistics	, Data Analysis and Comp	11-SDC-092-m01					
Module coordinator			Module offered by				
Managing	g Director of the Institute of	Applied Physics	Faculty of Physics a	nd Astronomy			
ECTS N	lethod of grading	Only after succ. con	npl. of module(s)				
4 n	umerical grade						
Duration	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 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				
Contents	1						
	, data analysis and compu	ter physics.					
	learning outcomes	, · ·					
	ents have specific and adva	anced knowledge in the	field of statistics, da	ata analysis and Con	nputational		
Courses (type, number of weekly contact hou	rs, language — if other than Gei	rman)				
R + V (no	information on SWS (week	ly contact hours) and co	ourse language avail	able)			
module is cr	f assessment (type, scope, lan editable for bonus)						
groups (a project re (approx. Assessme and will b examinat Language	examination (approx. 90 r pprox. 30 minutes per can port (approx. 8 to 10 pages 30 minutes) ent offered: When and how be announced in due form to ion regulations) 2009. e of assessment: German, B	didate, for modules with s, time to complete: 1 to r often assessment will h under 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		
Allocatio	n of places						
 Additiona	l information						
Workload							
Teaching	Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module a	ppears in						
Bachelor	degree (1 major) Physics (degree (1 major) Physics (
Master's with	1 major FOKUS Physics (2010)		• generated 26-Aug-2024 • G laster (120 ECTS) FOKUS Phys		page 202 / 389		

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 (2010)

Julius-Maxir

UNIVERSITÄT

WÜRZBURG



Other Modules Specialisation

(24 ECTS credits)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 204 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation					
Module Type 4A Special Training Astronomy 11-SF-4A-072-m01					
Module	e coord	inator		Module offered by	1
Manag and As	0	ector of the Institute of Th sics	neoretical Physics	Faculty of Physics a	and Astronomy
ECTS	Meth	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	c, adva	inced knowledge of one c	or more of the Faculty	's current research a	areas in the field of Astronomy.
Intend	ed lear	ning outcomes			
The stu field of			ed knowledge of one	e or more current res	earch areas of the faculty in the
Course	S (type, 1	number of weekly contact hours, l	anguage — if other than Ge	rman)	
V + R (r	no infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		s essment (type, scope, langua ole 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) oral examination of one candi- rt (approx. 8 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	immes)	
			-		
Module	e appea	ars in			
		ee (1 major) Physics (201	o)		
	-	ee (1 major) FOKUS Physi			
Master	's degr	ee (1 major) FOKUS Physi	cs (2006)		

Module title Abbreviation					
Module Type 4D Special Training Didactics11-SF-4D-072-m01					
Module coordinator Module offered by					
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)	
4		rical grade			
Duratio	on .	Module level	Other prerequisites	i	
1 seme	ster	graduate			
Conter	its				
Specifi	c, adva	nced knowledge of one	e or more of the Faculty	's current research a	areas in the field of Didactics.
-		ning outcomes			
The stu		have specific and adva	nced knowledge of one	e or more current res	earch areas of the faculty in the
Course	S (type, r	number of weekly contact hour	s, language — if other than Ge	rman)	
V + R (I	no infoi	rmation on SWS (weekl	y contact hours) and co	ourse language avail	able)
		Sessment (type, scope, lang ole for bonus)	uage — if other than German,	examination offered — if no	ot every semester, information on whether
		mination (approx. 90 m oral examination in grou) oral examination of one candi- rt (approx. 8 pages)
Allocat	ion of _l	places			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)	
Modul	e appea	ars in			
		ee (1 major) Physics (20	010)		
	•	ee (1 major) FOKUS Phy			
Master	's degr	ee (1 major) FOKUS Phy	rsics (2006)		

Modul	e title				Abbreviation
Module Type 4E Special Training Experimental Physics11-SF-4E-072-m01					
Module coordinator Module offered by					
Manag	ing Dir	ector of the Institute of A	Applied Physics	Faculty of Physics a	and Astronomy
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)	
4	nume	rical grade			
Duratio	on	Module level	Other prerequisites	;	
1 seme	ster	graduate			
Conten	ts		-		
Specifi Physic:		inced knowledge of one	or more of the Faculty	r's current research a	areas in the field of Experimental
Intend	ed lear	ning outcomes			
		have specific and advar mental Physics.	nced knowledge of one	e or more current res	earch areas of the faculty in the
Course	S (type, 1	number of weekly contact hours	, language — if other than Ge	rman)	
V + R (r	no infoi	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)
		s essment (type, scope, langu ble for bonus)	uage — if other than German,	examination offered — if no	ot every semester, information on whether
module is a) writt	s creditat	ole for bonus)	inutes) or b) talk (app	rox. 30 minutes) or c) oral examination of one candi-
module is a) writt	s creditat en exa ach or c	ole for bonus) mination (approx. 90 m pral examination in grou	inutes) or b) talk (app	rox. 30 minutes) or c) oral examination of one candi-
module is a) writt date ea Allocat	s creditat en exa ach or c ion of [^{ble for bonus)} mination (approx. 90 mi pral examination in grou places	inutes) or b) talk (app	rox. 30 minutes) or c) oral examination of one candi-
module is a) writt date ea Allocat 	s creditat en exa ach or c ion of [ole for bonus) mination (approx. 90 m pral examination in grou	inutes) or b) talk (app	rox. 30 minutes) or c) oral examination of one candi-
module is a) writt date ea Allocat Additic 	s creditation en exa ach or c ion of p onal inf	^{ble for bonus)} mination (approx. 90 mi pral examination in grou places	inutes) or b) talk (app	rox. 30 minutes) or c) oral examination of one candi-
module is a) writt date ea Allocat	s creditation en exa ach or c ion of p onal inf	^{ble for bonus)} mination (approx. 90 mi pral examination in grou places	inutes) or b) talk (app	rox. 30 minutes) or c) oral examination of one candi-
module i: a) writt date ea Allocat Additic Worklo	s creditab en exa ach or c ion of p onal inf	ple for bonus) mination (approx. 90 m oral examination in grou places formation	inutes) or b) talk (app	rox. 30 minutes) or c) oral examination of one candi-
module i: a) writt date ea Allocat Additic Worklo	s creditab en exa ach or c ion of p onal inf	ple for bonus) mination (approx. 90 m oral examination in grou places formation	inutes) or b) talk (app	rox. 30 minutes) or c) oral examination of one candi-
module i: a) writt date ea Allocat Additic Worklo Teachi	s creditab en exa ach or c ion of p onal inf pad	nination (approx. 90 m oral examination in grou places formation	inutes) or b) talk (app ps (approx. 30 minute	rox. 30 minutes) or c es) or d) project repo) oral examination of one candi-
module i: a) writt date ea Allocat Additic Worklo Teachi	s creditab en exa ach or c ion of p onal inf pad	ple for bonus) mination (approx. 90 m oral examination in grou places formation	inutes) or b) talk (app ps (approx. 30 minute	rox. 30 minutes) or c es) or d) project repo) oral examination of one candi-
module i: a) writt date ea Allocat Worklo Teachi Referre	s creditab en exa ach or c ion of p onal inf pad ng cycl ed to in	e LPO I (examination regulation	inutes) or b) talk (app ps (approx. 30 minute	rox. 30 minutes) or c es) or d) project repo) oral examination of one candi-
module is a) writt date ea Allocat Additic Worklo Teachi Referre Modulo	en exa ach or c ion of onal inf oad ed to in e appea	e E E E E E E E E E E E E E	inutes) or b) talk (app ps (approx. 30 minute 	rox. 30 minutes) or c es) or d) project repo) oral examination of one candi-
module i: a) writt date ea Allocat Modultic Teachi Referre Modula	s creditab en exa ach or c ion of p onal inf oad ad ed to in e appea 's degr	e (1 major) Physics (20	inutes) or b) talk (approx. 30 minutes) or b) talk (approx. 30	rox. 30 minutes) or c es) or d) project repo) oral examination of one candi-
module i: a) writt date ea Allocat Worklo Teachi Referre Module Master Master	s creditab en exa ach or c ion of p onal inf pad ad ad ad ad ad ad ad ad ad ad ad ad a	e (1 major) Physics (20 e (1 major) Nanostruction e (1 major) Nanostruction e (1 major) Nanostruction	inutes) or b) talk (app ps (approx. 30 minute 	rox. 30 minutes) or c es) or d) project repo) oral examination of one candi-
module i: a) writt date ea Allocat Moditic Teachi Referre Master Master Master	s creditab en exa ach or c ion of p onal inf pad ad ad ad ad ad ad ad ad ad ad ad ad a	e (1 major) Physics (20	inutes) or b) talk (app ps (approx. 30 minute s (approx. 30 minute ins for teaching-degree progra ins for teaching-degree progra ino) ure Technology (2010) sics - Nanostructuring	rox. 30 minutes) or c es) or d) project repo) oral examination of one candi-
module is a) writt date ea Allocat Additic Worklo Teachi Referre Module Master Master Master Master	s creditab en exa ach or o ion of onal inf oad ad ed to in e appea 's degr 's degr 's degr	e e e LPOI (examination regulation ars in e (1 major) Physics (20 ee (1 major) FOKUS Physics ee (1 major) F	inutes) or b) talk (app ps (approx. 30 minute 	rox. 30 minutes) or c es) or d) project repo ammes) Technology (2010)) oral examination of one candi-

Module title					Abbreviation	
Module Type 4I Special Training Interdisciplinary Researc				Fields	11-SF-4l-072-m01	
Module	e coord	inator		Module offered by		
-	-	ectors of the Institute of A f Theoretical Physics and		Faculty of Physics a	and Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
4	nume	rical grade				
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
		nced knowledge of one c	or more of the Faculty	's current research a	areas.	
		ning outcomes	, ,			
	dents	have specific and advanc	ed knowledge of one	or more current res	earch areas of the faculty in an in	
		number of weekly contact hours, l	anguage — if other than Ger	man)		
		rmation on SWS (weekly o			able)	
Metho	d of as				ot every semester, information on whether	
		mination (approx. 90 min oral examination in group) oral examination of one candi- rt (approx. 8 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 degr	ee (1 major) Physics (201	o)			
	Master's degree (1 major) Nanostructure Technology (2010)					
	-	ee (1 major) FOKUS Physi	-	Technology (2010)		
	-	ee (1 major) FOKUS Physi				
	-	ee (1 major) FOKUS Physi	-	Technology (2006)		
master	s aegr	ee (1 major) FOKUS Physi	(2006)			

Module title Abbreviation							
Module Type 4T Special Training Theoretical Physics11-SF-4T-072-m01							
Module	Module coordinator Module offered by						
Manag and As	0	ector of the Institute of Th sics	neoretical 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 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		
		ning outcomes					
		have specific and advance tical Physics.	ced knowledge of one	e or more current res	earch areas of the faculty in the		
Course	S (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 (appr	rox. 30 minutes) or c	ot every semester, information on whether) oral examination of one candi-		
Allocat							
Additio	onal inf	ormation					
Worklo	ad						
Teachi	ng cvcl	e					
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	ummes)			
Module	e appea	urs 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 5A Special Training Astronomy11-SF-5A-072-m01					
Module coordinator Module offered by					
Manag and As	-	ector of the Institute of Th sics	eoretical 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	on	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts	~			
Specifi	c, adva	nced knowledge of one o	or more of the Faculty	's current research a	areas in the field of Astronomy.
Intend	ed lear	ning outcomes			
The stu field of			ed knowledge of one	e or more current res	earch areas of the faculty in the
Course	S (type, 1	number of weekly contact hours, l	anguage — if other than Gei	rman)	
V + R (r	no infoi	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		Sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if n	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			
Additio	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	0)		
	-	ee (1 major) FOKUS Physi			
Master	's degr	ee (1 major) FOKUS Physi	cs (2006)		

Module title Abbreviation					
Module Type 5D Special Training Didactics11-SF-5D-072-m01					
Module coordinator Module offered by					
Manag	ing Dire	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)	
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ester	graduate			
Conter	nts		•		
Specifi	ic, adva	nced knowledge of one	or more of the Faculty	's current research a	reas in the field of Didactics.
		ning outcomes			
	udents	have specific and advan	ced knowledge of one	e or more current res	earch areas of the faculty in the
Course	S (type, r	number of weekly contact hours,	language — if other than Gei	rman)	
V + R (I	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avail	able)
		Sessment (type, scope, langua ole for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether
		mination (approx. 90 min oral examination in group) oral examination of one candi- rt (approx. 10 pages)
Allocat	tion of _l	places			
Additio	onal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
	- /				
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	immes)	
Modul	e appea	ars in			
		ee (1 major) Physics (201	.0)		
Master	's degr	ee (1 major) FOKUS Phys	ics (2010)		
Master	's degr	ee (1 major) FOKUS Phys	ics (2006)		

Module title					Abbreviation	
Modul	Module Type 5E Special Training Experimental Physics11-SF-5E-072-m01					
Modul	e coord	inator		Module offered by		
Manag	ing Dire	ector of the Institute of A	pplied Physics	Faculty of Physics	and Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
5		rical grade		· · · · · ·		
Duratio		Module level	Other prerequisites			
1 seme	ester	graduate				
Conter	nts		,			
Specifi Physic		nced knowledge of one o	or more of the Faculty	's current research	areas in the field of Experimenta	
Intend	ed lear	ning outcomes				
		have specific and advand mental Physics.	ced knowledge of one	or more current res	search areas of the faculty in the	
Course	es (type, r	number of weekly contact hours,	language — if other than Gei	rman)		
V + R (I	no infoi	rmation on SWS (weekly	contact hours) and co	ourse language avai	lable)	
		s essment (type, scope, langua ole for bonus)	age — 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- ort (approx. 10 pages)	
Allocat	tion of _l	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)		
Modul	e appea	ars in				
	-	ee (1 major) Physics (201				
Master's degree (1 major) Nanostructure Technology (2010)						
	-	ee (1 major) FOKUS Physi		Technology (2010)		
	-	ee (1 major) FOKUS Physi		Tashnalass (as a ()		
	-	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi	_	rechnology (2006)		
			(CC 12006)			

Module title					Abbreviation	
Module Type 5I Special Training Interdisciplinary Researc				Fields	11-SF-5l-072-m01	
Module	e coord	inator		Module offered by		
-	-	ectors of the Institute of A If Theoretical Physics and	,	Faculty of Physics a	and Astronomy	
ECTS	Meth	od of grading	Only after succ. con	pl. of module(s)		
5	nume	rical grade				
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Specifi	c, adva	inced knowledge of one o	or more of the Faculty	's current research a	areas.	
		ning outcomes	· · · ·			
The stu terdisc			ed knowledge of one	or more current res	earch areas of the faculty in an in	
Course	S (type, 1	number of weekly contact hours, l	anguage — if other than Gei	man)		
V + R (r	no infoi	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		S essment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
		mination (approx. 90 min oral examination in group) oral examination of one candi- rt (approx. 10 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 degr	ee (1 major) Physics (201	o)			
	Master's degree (1 major) Nanostructure Technology (2010)					
	-	ee (1 major) FOKUS Physi		Technology (2010)		
	-	ee (1 major) FOKUS Physi				
	-	ee (1 major) FOKUS Physi	-	Technology (2006)		
Master	's degr	ee (1 major) FOKUS Physi	CS (2006)			

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Module	e title				Abbreviation		
Module	Module Type 5T Special Training Theoretical Physics11-SF-5T-072-m01						
Module	Module coordinator Module offered by						
Manag and As	•	ector of the Institute of Th sics	neoretical Physics	Faculty of Physics a	ind 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						
Specifi Physics		nced knowledge of one o	or more of the Faculty	's current research a	reas in the field of Theoretical		
Intende	ed learı	ning outcomes					
		nave specific and advance tical Physics.	ced knowledge of one	e or more current res	earch areas of the faculty in the		
Course	S (type, n	umber 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 exai	^{le for bonus)} mination (approx. 90 mir	nutes) or b) talk (appr	rox. 30 minutes) or c	oral examination of one candi-		
		ral examination in group	s (approx. 30 minute	s) or d) project repoi	t (approx. 10 pages)		
Allocat	ion of p	Diaces					
Additio	nal inf	ormation					
Worklo	ad						
Teachi	ng cycl	e					
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	ammes)			
Module			>				
Master Master	's degro 's degro	ee (1 major) Physics (201 ee (1 major) Nanostructu ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi	re Technology (2010) cs - Nanostructuring				
Master	's degr	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi	cs - Nanostructuring	Technology (2006)			

Module title Abbreviation						
Module Type 6A Special Training Astronomy11-SF-6A-072-m01						
Module coordinator Module offered by						
Manag and As	-	ector of the Institute of Th sics	neoretical Physics	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				
Conten	ts	• •	·			
Specifi	c, adva	anced knowledge of one o	or more of the Faculty	's current research a	areas in the field of Astronomy.	
Intend	ed lear	ning outcomes				
The stu field of			ed knowledge of one	e or more current res	earch areas of the faculty in the	
Course	S (type, 1	number of weekly contact hours, I	anguage — if other than Ge	rman)		
V + R (r	no infoi	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		s essment (type, scope, langua ble for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
		mination (approx. 90 mir oral examination in group		-) oral examination of one candi- rt (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	immes)		
			-			
Module	e appea	ars in				
	••	ee (1 major) Physics (201	o)			
	•	ee (1 major) FOKUS Physi				
Master	's degr	ee (1 major) FOKUS Physi	cs (2006)			

Module title					Abbreviation	
Module Type 6D Special Training Didactics11-SF-6D-072-m01						
Modul	e coord	inator		Module offered by	, ,	
Manag	ing Dire	ector of the Institute of <i>I</i>	Applied Physics	Faculty of Physics	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				
Conter	nts	a				
Specifi	ic, adva	nced knowledge of one	or more of the Faculty	's current research	areas in the field of Didactics.	
		ning outcomes				
	udents f Didact		nced knowledge of one	e or more current res	search areas of the faculty in the	
Course	S (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
V + R (I	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avai	lable)	
module i	s creditab	le for bonus)			ot every semester, information on whether	
		mination (approx. 90 m oral examination in grou			c) oral examination of one candi ort (approx. 12 pages)	
Allocat	tion of _l	places				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulation	ons for teaching-degree progra	ammes)		
Modul	e appea	ars in				
	-	ee (1 major) Physics (20				
	-	ee (1 major) FOKUS Phy				
Master	's degr	ee (1 major) FOKUS Phy	sics (2006)			

Modul	e title				Abbreviation				
Modul	е Туре	6E Special Training Exp	perimental Physics		11-SF-6E-072-m01				
Modul	e coord	linator		Module offered by					
Manag	ing Dir	ector of the Institute of	Applied Physics	Faculty of Physics	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	ester	graduate							
Conter	nts	10	•						
Specifi Physic:		anced knowledge of on	e or more of the Faculty	's current research a	areas in the field of Experimenta				
Intend	ed lear	ning outcomes							
		have specific and adva mental Physics.	nced knowledge of one	e or more current res	earch areas of the faculty in the				
Course	es (type, I	number of weekly contact hour	s, language — if other than Ge	rman)					
V + R (I	no info	rmation on SWS (weekl	y contact hours) and co	ourse language avai	lable)				
		sessment (type, scope, lang ble for bonus)	guage — if other than German,	examination offered — if n	ot every semester, information on whether				
		mination (approx. 90 m oral examination in grou			 c) oral examination of one candi- ort (approx. 12 pages) 				
Allocat	tion of	places							
Additio	onal inf	ormation							
Worklo	ad								
Teachi	ng cycl	e							
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	ammes)					
Modul	e appea	ars in							
Master	r's degr	ee (1 major) Physics (2	010)						
	-	ee (1 major) Nanostruc							
	-		Master's degree (1 major) FOKUS Physics - Nanostructuring Technology (2010)						
	r's degr								
	Aaster's degree (1 major) FOKUS Physics (2010)								
Master	's degr	ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy	vsics - Nanostructuring	Technology (2006)					

Module title					Abbreviation
Module Type 6I Special Training Interdisciplinary Research				Fields	11-SF-6I-072-m01
Module	e coord	inator		Module offered by	
		ectors of the Institute of A f Theoretical Physics and		Faculty of Physics a	and Astronomy
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				
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	e or more current res	earch areas of the faculty in an ir
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)	
V + R (r	no infor	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		s essment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether
		mination (approx. 90 min oral examination in group) oral examination of one candi- rt (approx. 12 pages)
Allocat	ion of _l	places			
Additio	nal inf	ormation			
Worklo	ad				
	-				
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	immes)	
Module	appea	ars 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			
	-	ee (1 major) FOKUS Physi	-	Technology (2006)	
master	s aegr	ee (1 major) FOKUS Physi	CS (2006)		

Module	e title				Abbreviation
Module Type 6T Special Training Theoretical Physics11-SF-6T-072-mod					11-SF-6T-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	ind 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				
Specifi Physics		nced knowledge of one o	or more of the Faculty	's current research a	reas in the field of Theoretical
Intende	ed lear	ning outcomes			
		have specific and advance tical Physics.	ed knowledge of one	e or more current res	earch areas of the faculty in the
Course	S (type, r	number of weekly contact hours, I	anguage — if other than Ge	rman)	
V + R (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
module is a) writt	en exa	le for bonus)	nutes) or b) talk (appr	rox. 30 minutes) or c	oral examination of one candi-
Allocat			s (approx. 30 minute	s) of a) project repoi	it (applox. 12 pages)
Allocal		Jaces			
Additio	nal inf	ormation			
	mat mit				
Worklo	ad		-		
Teachi		۹.			
	Seyet				
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	ummes)	
Module	e appea	urs 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) cs - Nanostructuring cs (2010) cs - Nanostructuring		

Module title					Abbreviation	
Module Type 8A Special Training Astronomy11-SF-8A-072-m01						
Module coordinator Module offered by						
Manag and As		ector of the Institute of Th sics	neoretical 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	ts					
Specifi	c, adva	anced knowledge of one o	or more of the Faculty	's current research a	areas in the field of Astronomy.	
		ning outcomes	,		,	
The stu field of			ed knowledge of one	e or more current res	earch areas of the faculty in the	
Course	S (type, 1	number of weekly contact hours, I	anguage — if other than Gei	rman)		
V + R (r	no infoi	rmation on SWS (weekly o	contact hours) and co	ourse language avail	able)	
		sessment (type, scope, langua	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
			utac) at h) talk (ann	vov og minutag) or g) oral examination of one candi-	
		pral examination in group		-		
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	immes)		
		-	- · · ·			
Module	e appea	ars in				
		ee (1 major) Physics (201	o)			
	•	ee (1 major) FOKUS Physi				
Master	's degr	ee (1 major) FOKUS Physi	cs (2006)			

Modul	e title			Abbreviation	
Module Type 8D Special Training Didactics11-SF-8D-072-m01					
Modul	e coord	inator		Module offered by	1
Manag	ing Dire	ector of the Institute of A	Applied Physics	Faculty of Physics	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			
Conter	nts		-		
Specifi	ic, adva	nced knowledge of one	or more of the Faculty	's current research a	areas in the field of Didactics.
		ning outcomes	,		
The stu	-	have specific and advan	ced knowledge of one	e or more current res	earch areas of the faculty in the
Course	es (type, r	number of weekly contact hours	, language — if other than Ge	rman)	
V + R (I	no infoi	mation on SWS (weekly	contact hours) and co	ourse language avai	lable)
module i	s creditab	le for bonus)	_		ot every semester, information on whether
		oral examination in grou			
Allocat	tion of _l	places			
	1				
Additio	onal inf	ormation			
Worklo	bad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulatio	ns for teaching-degree progra	immes)	
Modul	e appea	ars in			
Master	r's degr	ee (1 major) Physics (20	10)		
	-	ee (1 major) FOKUS Phys			
Master	r's degr	ee (1 major) FOKUS Phys	sics (2006)		

Modul	e title				Abbreviation
Module Type 8E Special Training Experimental Physics					11-SF-8E-072-m01
Modul	e coord	inator		Module offered by	
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)	
8	nume	rical grade			
Duratio		Module level	Other prerequisites	i	
1 seme	ester	graduate			
Conter	nts		Į		
Specifi Physic		inced knowledge of one	or more of the Faculty	's current research a	reas in the field of Experimental
Intend	ed lear	ning outcomes			
		have specific and advan mental Physics.	ced knowledge of one	e or more current res	earch areas of the faculty in the
Course	es (type, i	number of weekly contact hours,	language — if other than Ge	rman)	
V + R (I	no infoi	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)
		s essment (type, scope, langu ble for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether
		mination (approx. 90 mi oral examination in grou) oral examination of one candi- rt (approx_16 pages)
	tion of				
Additio	onal inf	ormation			
Worklo	bad				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	ammes)	
		arc in			
Modul	e appea				
		ee (1 major) Physics (20:	10)		
Master	r's degr r's degr	ee (1 major) Physics (20: ee (1 major) Nanostructu	ıre Technology (2010)		
Master Master Master	r's degr r's degr r's degr	ee (1 major) Physics (20) ee (1 major) Nanostructu ee (1 major) FOKUS Phys	ire Technology (2010) ics - Nanostructuring	Technology (2010)	
Master Master Master Master	r's degr r's degr r's degr r's degr	ee (1 major) Physics (20: ee (1 major) Nanostructu ee (1 major) FOKUS Phys ee (1 major) FOKUS Phys	ire Technology (2010) ics - Nanostructuring ics (2010)		
Master Master Master Master Master	r's degr r's degr r's degr r's degr r's degr	ee (1 major) Physics (20) ee (1 major) Nanostructu ee (1 major) FOKUS Phys	ire Technology (2010) ics - Nanostructuring ics (2010) ics - Nanostructuring		

Module title					Abbreviation
Module	е Туре	8I Special Training Interc	lisciplinary Research	I Fields	11-SF-8l-072-m01
Module	e coord	inator		Module offered by	1
		ectors of the Institute of A f Theoretical Physics and		Faculty of Physics a	and Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
8	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Specifi	c.adva	nced knowledge of one c	or more of the Faculty	's current research a	areas.
		ning outcomes			
	dents	have specific and advanc	ed knowledge of one	e or more current res	earch areas of the faculty in an ir
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)	
V + R (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
		Sessment (type, scope, langua Ile for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether
		mination (approx. 90 min oral examination in group) oral examination of one candi- rt (approx. 16 pages)
Allocat	ion of _l	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	ummes)	
		-	- · · ·		
Module	e appea	ars in			
		ee (1 major) Physics (201	0)		
Master	's degr	ee (1 major) Nanostructui	re Technology (2010)		
	-	ee (1 major) FOKUS Physi	-	Technology (2010)	
	-	ee (1 major) FOKUS Physi		T ()	
	-	ee (1 major) FOKUS Physi	-	Technology (2006)	
master	s uegr	ee (1 major) FOKUS Physi	(2000)		

Modul	e title				Abbreviation
Modul	e Type 8	BT Special Training Theo	oretical Physics		11-SF-8T-072-m01
Modul	e coord	inator		Module offered by	1
	ing Dire trophys	ector of the Institute of Tl sics	neoretical Physics	Faculty of Physics a	and Astronomy
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
8	nume	rical grade			
Duratio	on	Module level	Other prerequisites	i	
1 seme	ster	graduate			
Conter	its		•		
Specifi Physic:		nced knowledge of one	or more of the Faculty	's current research a	reas in the field of Theoretical
Intend	ed learr	ning outcomes			
The stu	udents l		ced knowledge of one	e or more current res	earch areas of the faculty in the
Course	S (type, n	umber of weekly contact hours,	language — if other than Ge	rman)	
V + R (I	no infor	mation on SWS (weekly	contact hours) and co	ourse language avail	able)
Metho	d of ass	*			ot every semester, information on whether
		mination (approx. 90 min ral examination in group) oral examination of one candi- rt (approx. 16 pages)
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	ammes)	
Modul	e appea	irs in			
Master	's degre	ee (1 major) Physics (201			
	-	ee (1 major) FOKUS Phys	-	Technology (2010)	
	-	ee (1 major) FOKUS Phys		Tachnology (acc)	
	-	ee (1 major) FOKUS Phys ee (1 major) FOKUS Phys	•	rechnology (2006)	
mastel	5 uegn	ce (1 major) i ORUS FILIS	(2000)		



Compulsory Electives Research Modules Physics

(16 ECTS credits)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 225 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation						
FOKUS Research Module Type VK8A Astronomy 11-FM-VK8A-072-mo3					01	
Module	coord	inator		Module offered by		
chairpe	rson o	f examination committe	e	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	i		
1 seme	ster	graduate				
Conten	ts					
cipline lication	of Astr of the	dvanced knowledge of onomy, reproduction of acquired professional riments, case studies e	knowledge, acquisition knowledge and metho	on of social and meth	nodological compete	ncies. App-
Intende	ed lear	ning outcomes				
especia acquire	ally in t d meth	have special and advan he specialist field of As nods, to summarise a su ement the acquired kno	tronomy, and are able ub-area of the current i	to reproduce the acc research area in an o	quired knowledge, to ral presentation and	o apply the
Course	S (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
(1 week FOKUS	ly cont Kompa Englis	rungsmodul Astronomie cact hour), details on av aktseminar Astronomie h, details on availability	ailability to be annour (FOKUS Block Taught S	iced Seminar Astronomy):	S (2 weekly contact	hours), Ger-
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
1. Topic tes) c repoi	cs cove or oral rt (app	as the following assess red in lectures and exe examination of one can rox. 8 pages) lk (approx. 30 to 45 mir	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 will t register for assessmer en assessment compon nodule, students must p	nt components 1 and 2 ents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ıg cycl	e				
Referre	d to in	LPOI (examination regulation	ns for teaching-degree progra	ammes)		
Module	appea	ars in				
Master's wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e Naster (120 ECTS) FOKUS Phys	-	page 226 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 227 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title					Abbreviation	
FOKUS Research Module Type VK8D Didactics					11-FM-VK8D-072-m	01
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	Faculty of Physics a	ind 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				
Conten	ts					
cipline cation o	of Dida of the a	dvanced knowledge of i actics, reproduction of k acquired professional kn riments, case studies et	nowledge, acquisition owledge and methods	of social and metho	odological competen	cies. Appli-
Intende	ed lear	ning outcomes				
especia quired	ally in t metho	have special and advanc he specialist field of Did ds, to summarise a sub- the acquired knowledge	actics, and are able to area of the current res	o reproduce the acqu earch area in an ora	uired knowledge, to	apply the ac-
Course	S (type, r	number of weekly contact hours,	language — if other than Ger	man)		
weekly FOKUS or Engli break)	contac Kompa ish, dei	rungsmodul Didaktik (FC It hour), details on availa Iktseminar Didaktik (FOF tails on availability to be	ability to be announce (US Block Taught Sem e announced (block ta	d inar Didactics): S (2 ught seminar (3 day:	weekly contact hou s), usually held durin	rs), German ng semester
		sessment (type, scope, langu le for bonus)	age — if other than German, e	examination offered — if no	ot every semester, informat	ion on whether
1. Topic tes) c repor	cs cove or oral rt (appi	as the following assess red in lectures and exer- examination of one cano rox. 8 pages) lk (approx. 30 to 45 min	cises: written examina lidate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 will t register for assessmen en assessment compone nodule, students must p	t components 1 and 2 ents 1 and 2 will be off	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of p	olaces				
 Additio 	nal inf	ormation				
Worklo	ad					
		2				
Teachir	ig cycl	e	_			
Referre	d to in	LPO I (examination regulation	ns for teaching-degree progra	mmes)		
Module	e appea	ars in				
Master's wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • 6	-	page 228 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 229 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK8E	Experimental Physics		11-FM-VK8E-072-mc	01
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	ee	Faculty of Physics a	nd 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 seme	ster	graduate				
Conten	ts					
cipline cies. Ap	of Expe oplicati	dvanced knowledge of erimental Physics, repr ion of the acquired pro e.g. experiments, case	oduction of knowledge essional knowledge ar	, acquisition of socia	al and methodologica	al competen-
Intende	ed lear	ning outcomes				
especia apply tl	ally in t he acq	have special and advar he specialist field of Ex uired methods, to sum mplement the acquired	perimental Physics, an narise a sub-area of th	d are able to reprod e current research ar	uce the acquired kno rea in an oral presen	owledge, to
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
contact FOKUS contact	t hours) Kompa t hours)	rungsmodul Experimen) + Ü/P (1 weekly conta aktseminar Experimento), German or English, d semester break)	ct hour), details on ava elle Physik (FOKUS Bloo	ilability to be annou ck Taught Seminar Ex	nced (perimental Physics)	: S (2 weekly
		s essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
1. Topic tes) c repor	cs cove or oral rt (app	as the following asses red in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 mi	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 wil t register for assessme en assessment compo nodule, students must	nt components 1 and 2 ients 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of j	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				
						I
Master's wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • 6 Naster (120 ECTS) FOKUS Phys	-	page 230 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 231 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK8I I	nterdisciplinary Resea	rch Fields	11-FM-VK8I-072-mo	1
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	Faculty of Physics a	nd 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 seme	ster	graduate				
Conten	ts					
terdisci lication	iplinary 1 of the	dvanced knowledge of v subject, reproduction acquired professional riments, case studies e	of knowledge, acquisit knowledge and metho	ion of social and me	thodological compe	tencies. App-
Intende	ed lear	ning outcomes				
especia the acq	ally in a Juired r	have special and advan an interdisciplinary spec nethods, to summarise ement the acquired kno	ialist field, and are ab a sub-area of the curre	le to reproduce the a ent research area in a	acquired knowledge, an oral presentation	, to apply
Course	S (type, r	number of weekly contact hours	, language — if other than Gei	rman)		
Fields): FOKUS Fields):	: V (2 w Kompa : S (2 w	rungsmodul Interdiszip eekly contact hours) + l aktseminar Interdiszipli eekly contact hours), G), usually held during se	J/P (1 weekly contact ł näre Fachgebiete (FOK erman or English, deta	nour), details on avai US Block Taught Sen	ilability to be annou ninar Interdisciplina	nced ry Research
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	ion on whether
1. Topic tes) c repo	cs cove or oral rt (app	as the following assess red in lectures and exe examination of one can rox. 8 pages) lk (approx. 30 to 45 mir	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 will t register for assessmer en assessment compon nodule, students must p	nt components 1 and 2 ents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	ars in				
Master's wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 232 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 233 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK8T	Theoretical Physics		11-FM-VK8T-072-mc)1
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	Faculty of Physics a	ind Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
cipline cies. Ap	of The oplicati	dvanced knowledge of pretical Physics, reprod ion of the acquired prof e.g. experiments, case	uction of knowledge, a essional knowledge ar	cquisition of social a	and methodological	competen-
Intende	ed lear	ning outcomes				
especia ply the	ally in t acquir	have special and advar he specialist field of Th ed methods, to summa mplement the acquired	eoretical Physics, and rise a sub-area of the c	are able to reproduc urrent research area	e the acquired know in an oral presentat	ledge, to ap-
Course	S (type, r	number of weekly contact hour	s, language — if other than Ger	rman)		
contact FOKUS contact	t hours Kompa t hours	rungsmodul Theoretisc) + Ü/P (1 weekly conta Iktseminar Theoretisch), German or English, d semester break)	ct hour), details on ava e Physik (FOKUS Block	ilability to be annou Taught Seminar The	nced oretical Physics): S (2 weekly
		sessment (type, scope, lang le for bonus)	uage — if other than German, o	examination offered — if no	ot every semester, informati	on on whether
1. Topic tes) c repor	cs cove or oral rt (app	as the following assested ared in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 min	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 wil t register for assessme en assessment compor nodule, students must	nt components 1 and 2 ients 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	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 wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 234 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 235 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK9A	Astronomy		11-FM-VK9A-072-m	01
Module	coord	inator		Module offered by		
chairpe	rson o	f examination committe	e	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
9	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conten	Contents					
cipline lication	of Astr of the	dvanced knowledge of onomy, reproduction of acquired professional riments, case studies e	knowledge, acquisition knowledge and metho	on of social and meth	nodological compete	ncies. App-
Intende	ed lear	ning outcomes				
especia acquire	ally in t d meth	have special and advan he specialist field of As nods, to summarise a su ement the acquired kno	tronomy, and are able ub-area of the current i	to reproduce the acc research area in an o	quired knowledge, to ral presentation and	o apply the
Course	S (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
(1 week FOKUS	ly cont Kompa Englis	rungsmodul Astronomie cact hour), details on av aktseminar Astronomie h, details on availability	ailability to be annour (FOKUS Block Taught S	iced Seminar Astronomy):	S (2 weekly contact	hours), Ger-
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
1. Topic tes) c repoi	cs cove or oral rt (app	as the following assess red in lectures and exe examination of one can rox. 8 pages) lk (approx. 30 to 45 mir	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 will t register for assessmer en assessment compon nodule, students must p	nt components 1 and 2 ents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	ars in				
Master's wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e Naster (120 ECTS) FOKUS Phys	-	page 236 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 237 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK9D D	lidactics		11-FM-VK9D-072-m	01
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committee	2	Faculty of Physics a	ind Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
9	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Contents					
cipline cation o	of Dida of the a	dvanced knowledge of i actics, reproduction of k acquired professional kn riments, case studies et	nowledge, acquisition owledge and methods	of social and metho	odological competen	ncies. Appli-
Intende	ed lear	ning outcomes				
especia quired	ally in t metho	have special and advanc he specialist field of Did ds, to summarise a sub- the acquired knowledge	actics, and are able to area of the current res	o reproduce the acqu earch area in an ora	uired knowledge, to	apply the ac-
Course	S (type, r	number of weekly contact hours,	language — if other than Ger	man)		
weekly FOKUS or Engli break)	contac Kompa ish, dei	rungsmodul Didaktik (FC t hour), details on availa ktseminar Didaktik (FOF tails on availability to be	ability to be announce (US Block Taught Sem announced (block ta	d inar Didactics): S (2 ught seminar (3 day:	weekly contact hou s), usually held durin	rs), German ng semester
		sessment (type, scope, langu le for bonus)	age — if other than German, e	examination offered — if no	ot every semester, informat	ion on whether
1. Topic tes) c repor	cs cove or oral rt (appi	as the following assess red in lectures and exer- examination of one cano rox. 8 pages) lk (approx. 30 to 45 min	cises: written examina lidate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 will t register for assessmen en assessment compone nodule, students must p	t components 1 and 2 ents 1 and 2 will be off	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of p	olaces				
 Additional information Workload						
Teaching cycle						
-						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	urs in				
Master's wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e	-	page 238 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 239 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK9E	Experimental Physics		11-FM-VK9E-072-mc)1
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	ee	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
9	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
cipline cies. Ap	of Expe oplicati	dvanced knowledge of erimental Physics, repr ion of the acquired pro e.g. experiments, case	oduction of knowledge essional knowledge ar	, acquisition of socia	al and methodologica	al competen-
Intende	ed lear	ning outcomes				
especia apply tl	ally in t he acq	have special and advar he specialist field of Ex uired methods, to sum mplement the acquired	perimental Physics, an narise a sub-area of th	d are able to reprod e current research ar	uce the acquired kno rea in an oral presen	owledge, to
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
contact FOKUS contact	t hours) Kompa t hours)	rungsmodul Experimen) + Ü/P (1 weekly conta aktseminar Experimento), German or English, d semester break)	ct hour), details on ava elle Physik (FOKUS Bloo	ilability to be annou k Taught Seminar Ex	nced (perimental Physics)	: S (2 weekly
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
1. Topic tes) c repor	cs cove or oral rt (app	as the following asses red in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 mi	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 wil t register for assessme en assessment compor 10dule, students must	nt components 1 and 2 nents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	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 wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • 6 laster (120 ECTS) FOKUS Phys	-	page 240 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 241 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK9I I	nterdisciplinary Resea	rch Fields	11-FM-VK9I-072-mo	91
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
9	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
terdisci lication	iplinary 1 of the	dvanced knowledge of v subject, reproduction acquired professional riments, case studies e	of knowledge, acquisit knowledge and metho	ion of social and me	thodological compe	tencies. App-
Intende	ed lear	ning outcomes				
especia the acq	ally in a Juired r	have special and advan in interdisciplinary spec nethods, to summarise ement the acquired kno	ialist field, and are ab a sub-area of the curre	le to reproduce the a ent research area in a	acquired knowledge, an oral presentation	, to apply
Course	S (type, r	number of weekly contact hours	, language — if other than Gei	rman)		
Fields): FOKUS Fields):	: V (3 w Kompa : S (2 w	rungsmodul Interdiszip eekly contact hours) + ĺ ktseminar Interdiszipli eekly contact hours), G I, usually held during se	J/P (1 weekly contact h näre Fachgebiete (FOK erman or English, deta	iour), details on avai US Block Taught Sen	ilability to be annou ninar Interdisciplina	nced ry Research
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	ion on whether
1. Topic tes) c repo	cs cove or oral rt (app	as the following assess red in lectures and exe examination of one can rox. 8 pages) lk (approx. 30 to 45 mir	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 will t register for assessmer en assessment compon nodule, students must p	nt components 1 and 2 ents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	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 wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 242 / 389

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, , , , ,	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK9T	Theoretical Physics		11-FM-VK9T-072-mc)1
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	Faculty of Physics a	ind Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
9	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
cipline cies. Ap	of Theo oplicati	dvanced knowledge of oretical Physics, reprod ion of the acquired prof e.g. experiments, cases	uction of knowledge, a essional knowledge ar	cquisition of social a	and methodological	competen-
Intende	ed lear	ning outcomes				
especia ply the	ally in t acquir	have special and advar he specialist field of Th ed methods, to summa mplement the acquired	eoretical Physics, and rise a sub-area of the c	are able to reproduc urrent research area	e the acquired know in an oral presentat	ledge, to ap-
Course	S (type, r	number of weekly contact hour	s, language — if other than Ger	rman)		
contact FOKUS contact	t hours) Kompa t hours)	rungsmodul Theoretisc) + Ü/P (1 weekly conta aktseminar Theoretisch), German or English, d semester break)	ct hour), details on ava e Physik (FOKUS Block	ilability to be annou Taught Seminar The	nced oretical Physics): S (2 weekly
		s essment (type, scope, lang ole for bonus)	uage — if other than German, o	examination offered — if no	ot every semester, informati	on on whether
1. Topic tes) c repor	cs cove or oral rt (app	as the following assested and ectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 min	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 will t register for assessme en assessment compor nodule, students must	nt components 1 and 2 ients 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	places				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	ars in				
Master's wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 244 / 389

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	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resear	rch Module Type VK10A	Astronomy		11-FM-VK10A-072-m	101
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	ee	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i i		
1 seme	ster	graduate				
Conten	ts					
cipline lication	of Astro of the	dvanced knowledge of onomy, reproduction o acquired professional riments, case studies e	knowledge, acquisition knowledge and metho	on of social and meth	nodological compete	ncies. App-
Intende	ed learı	ning outcomes				
especia acquire	ally in t ed meth	nave special and advar he specialist field of As nods, to summarise a s ement the acquired kno	tronomy, and are able ub-area of the current i	to reproduce the acc research area in an o	quired knowledge, to ral presentation and	o apply the
Course	S (type, n	umber of weekly contact hour	s, language — if other than Ge	rman)		
(2 week FOKUS	kly cont Kompa Englisi	rungsmodul Astronomi tact hours), German or ktseminar Astronomie n, details on availabilit	English, details on ava (FOKUS Block Taught S	ilability to be annou Seminar Astronomy):	nced S (2 weekly contact	hours), Ger-
		essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
1. Topic tes) c repor	cs cove or oral (rt (appi	as the following asses red in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 min	rcises: written examina didate each or oral exa			
Studen Details	ts mus on whe	omponents 1 and 2 will t register for assessme en assessment compor odule, students must j	nt components 1 and 2 ients 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	ins in				
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master's Wi	ur i majoi	FOKUS Physics (2010)	-	• egenerated 26-Aug-2024 • e Naster (120 ECTS) FOKUS Phys	-	page 246 / 389

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Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK10D	Didactics		11-FM-VK10D-072-n	101
Module	coord	inator		Module offered by		
chairpe	rson o	f examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Contents					
cipline cation o	of Dida of the a	dvanced knowledge of i actics, reproduction of k acquired professional kn riments, case studies et	nowledge, acquisition owledge and method	of social and metho	dological competen	cies. Appli-
Intende	ed learı	ning outcomes				
especia quired	ally in t method	nave special and advand he specialist field of Did ds, to summarise a sub- he acquired knowledge	actics, and are able to area of the current res	o reproduce the acquearch area in an ora	uired knowledge, to	apply the ac-
Course	S (type, n	umber of weekly contact hours,	language — if other than Ger	man)		
weekly FOKUS or Engli break)	contac Kompa sh, det	rungsmodul Didaktik (FC t hours), details on avai ktseminar Didaktik (FOF tails on availability to be sessment (type, scope, langu	lability to be announc (US Block Taught Sem e announced (block ta	ed inar Didactics): S (2 ught seminar (3 day:	weekly contact hou s), usually held durin	rs), German ng semester
module is	creditab	le for bonus)				
1. Topic tes) c repor	cs cove or oral o rt (appi	as the following assess red in lectures and exer examination of one cano rox. 8 pages) lk (approx. 30 to 45 min	cises: written examina lidate each or oral exa			
Studen Details	ts mus on whe	omponents 1 and 2 will t register for assessmen en assessment compon- iodule, students must p	t components 1 and 2 ents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of p	olaces				
Additional information						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	nrs in				
Master's wi	th 1 majoı	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e	-	page 248 / 389

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Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK10B	Experimental Physics		11-FM-VK10E-072-m	101
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	Faculty of Physics a	ind Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
cipline cies. Ap	of Expe oplicati	dvanced knowledge of erimental Physics, repr ion of the acquired prof e.g. experiments, cases	oduction of knowledge essional knowledge ar	, acquisition of socia	al and methodologica	al competen-
Intende	ed lear	ning outcomes				
especia apply tl	ally in t he acq	have special and advar he specialist field of Ex uired methods, to sum mplement the acquired	perimental Physics, an narise a sub-area of th	d are able to reprod e current research ar	uce the acquired kno rea in an oral presen	owledge, to
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
contact FOKUS contact	t hours) Kompa t hours)	rungsmodul Experimen) + Ü/P (2 weekly conta aktseminar Experimente), German or English, d semester break)	ct hours), details on av elle Physik (FOKUS Bloo	ailability to be anno k Taught Seminar Ex	unced xperimental Physics)	: S (2 weekly
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informati	on on whether
1. Topic tes) c repor	cs cove or oral rt (app	as the following assested ared in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 min	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 wil t register for assessme en assessment compor nodule, students must	nt components 1 and 2 ients 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	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				
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Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK10I	Interdisciplinary Rese	arch Fields	11-FM-VK10I-072-m	01
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	ee	Faculty of Physics a	nd Astronomy	
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	graduate				
Conten	Contents					
terdisci lication	iplinary 1 of the	dvanced knowledge of v subject, reproduction acquired professional riments, case studies e	of knowledge, acquisit knowledge and metho	ion of social and me	thodological compe	tencies. App-
Intende	ed lear	ning outcomes				
especia the acq	ally in a Juired r	have special and advar in interdisciplinary spe nethods, to summarise ement the acquired kno	cialist field, and are ab a sub-area of the curre	le to reproduce the a ent research area in a	acquired knowledge, an oral presentation	to apply
Course	S (type, r	number of weekly contact hour	s, language — if other than Ger	rman)		
Fields): FOKUS Fields): minar (: V (3 w Kompa : S (2 w 3 days)	rungsmodul Interdiszip eekly contact hours) + Iktseminar Interdiszipli eekly contact hours), G I, usually held during s cessment (type, scope, lang	Ü/P (2 weekly contact H näre Fachgebiete (FOK erman or English, deta emester break)	nours), details on av US Block Taught Sen ils on availability to	ailability to be anno ninar Interdisciplina be announced (bloc	unced ry Research k taught se-
		le for bonus)			cevery semester, mornal	ion on whether
1. Topic tes) c repo	cs cove or oral rt (app	as the following asses red in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 min	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 wil t register for assessme en assessment compor nodule, students must	nt components 1 and 2 nents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	ars in				
AA · · ·						
Master's wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 252 / 389

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Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK101	Theoretical Physics		11-FM-VK10T-072-m	01
Module	coord	inator		Module offered by		
chairpe	rson o	f examination committe	e	Faculty of Physics a	ind Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conten	ts					
cipline cies. Ap	of Theo oplicati	dvanced knowledge of pretical Physics, reprod ion of the acquired prof e.g. experiments, case s	uction of knowledge, a essional knowledge ar	acquisition of social	and methodological	competen-
Intende	ed lear	ning outcomes				
especia ply the	ally in t acquir	have special and advar he specialist field of Th ed methods, to summa mplement the acquired	eoretical Physics, and rise a sub-area of the c	are able to reproduc current research area	e the acquired know in an oral presentat	ledge, to ap-
Course	S (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
contact FOKUS contact	hours Kompa hours	rungsmodul Theoretisc) + Ü/P (2 weekly conta Iktseminar Theoretisch), German or English, d semester break)	ct hours), details on av e Physik (FOKUS Block	vailability to be anno Taught Seminar The	unced oretical Physics): S (2 weekly
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
1. Topic tes) c repoi	cs cove or oral rt (app	as the following assested ared in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 min	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 will t register for assessme en assessment compor 10dule, students must	nt components 1 and 2 ents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	ars in				
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Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK12A	Astronomy		11-FM-VK12A-072-m	101
Module	coord	inator		Module offered by		
chairpe	rson o	f examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
12	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conten	Contents					
cipline lication	of Astr of the	dvanced knowledge of onomy, reproduction of acquired professional riments, case studies e	knowledge, acquisition knowledge and metho	on of social and meth	nodological compete	ncies. App-
Intende	ed lear	ning outcomes				
especia acquire	ally in t d meth	have special and advan he specialist field of As nods, to summarise a su ement the acquired kno	tronomy, and are able ub-area of the current i	to reproduce the acc research area in an o	quired knowledge, to ral presentation and	o apply the
Course	S (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
(2 week FOKUS	dy con Kompa Englisi	rungsmodul Astronomie tact hours), details on a aktseminar Astronomie h, details on availability	vailability to be annou (FOKUS Block Taught S	unced Seminar Astronomy):	S (2 weekly contact	hours), Ger-
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
1. Topic tes) c repoi	cs cove or oral rt (appi	as the following assess red in lectures and exe examination of one can rox. 8 pages) lk (approx. 30 to 45 mir	rcises: written examina didate each or oral exa			
Studen Details	ts mus on whe	omponents 1 and 2 will t register for assessmer en assessment compon nodule, students must p	nt components 1 and 2 ents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	ars in				
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Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK12D	Didactics		11-FM-VK12D-072-n	101
Module	coord	inator		Module offered by		
chairpe	rson o	f examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
12	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Contents					
cipline cation o	of Dida of the a	dvanced knowledge of i actics, reproduction of k acquired professional kn riments, case studies et	nowledge, acquisition owledge and method	of social and metho	dological competen	cies. Appli-
Intende	ed leari	ning outcomes				
especia quired	ally in t methoo	nave special and advanc he specialist field of Did ds, to summarise a sub- he acquired knowledge	actics, and are able to area of the current res	o reproduce the acquearch area in an ora	uired knowledge, to	apply the ac-
Course	S (type, n	umber of weekly contact hours,	language — if other than Ger	man)		
weekly FOKUS or Engli break) Methoo	contac Kompa ish, def	rungsmodul Didaktik (FC t hours), details on avai ktseminar Didaktik (FO tails on availability to be sessment (type, scope, langu le for bonus)	lability to be announc (US Block Taught Sem announced (block ta	ed inar Didactics): S (2 ught seminar (3 days	weekly contact hou s), usually held durin	rs), German ng semester
 Topic tes) c repor Semi Assessi 	cs cove or oral o rt (appi nar: ta ment co	as the following assess red in lectures and exer- examination of one cand rox. 8 pages) lk (approx. 30 to 45 min omponents 1 and 2 will t register for assessmen	cises: written examina lidate each or oral exa utes) be offered in German	amination in groups or English.	(approx. 30 minutes	
Details	on whe	en assessment compone odule, students must p	ents 1 and 2 will be of	fered to be announce	ed.	nt 2.
Allocat	ion of p	olaces				
 Additional information Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
 Module	appea	irs in				
Master's wi	th 1 majoi	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e	-	page 258 / 389

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Module title			Abbreviation			
FOKUS Research Module Type VK12E Experimental Physics			11-FM-VK12E-072-m	01		
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	ee	Faculty of Physics a	ind Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
12	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
cipline cies. Ap	of Expe oplicati	dvanced knowledge of erimental Physics, repr ion of the acquired pro e.g. experiments, case	oduction of knowledge essional knowledge ar	, acquisition of socia	al and methodologica	al competen-
Intende	ed lear	ning outcomes				
especia apply tl	ally in t he acq	have special and advar he specialist field of Ex uired methods, to sum mplement the acquired	perimental Physics, an narise a sub-area of th	d are able to reprod e current research ar	uce the acquired kno rea in an oral presen	owledge, to
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
contact FOKUS contact	t hours) Kompa t hours)	rungsmodul Experimen) + Ü/P (2 weekly conta aktseminar Experimento), German or English, d semester break)	ct hours), details on av elle Physik (FOKUS Bloc	vailability to be anno k Taught Seminar Ex	unced xperimental Physics)	: S (2 weekly
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informati	on on whether
1. Topic tes) c repor	cs cove or oral rt (app	as the following asses red in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 mi	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 wil t register for assessme en assessment compor nodule, students must	nt components 1 and 2 nents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	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				
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Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK12I	Interdisciplinary Rese	arch Fields	11-FM-VK12I-072-m	01
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	Faculty of Physics a	ind Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
12	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
terdisci lication	iplinary 1 of the	dvanced knowledge of v subject, reproduction acquired professional riments, case studies e	of knowledge, acquisit knowledge and metho	ion of social and me	thodological compe	tencies. App-
Intende	ed lear	ning outcomes				
especia the acq	ally in a Juired r	have special and advan an interdisciplinary spec nethods, to summarise ement the acquired kno	ialist field, and are ab a sub-area of the curre	le to reproduce the a ent research area in a	acquired knowledge an oral presentation	, to apply
Course	S (type, r	number of weekly contact hours	, language — if other than Ger	rman)		
Fields): FOKUS Fields):	: V (4 w Kompa : S (2 w	rungsmodul Interdiszip eekly contact hours) + i uktseminar Interdiszipli eekly contact hours), G), usually held during se	J/P (2 weekly contact l näre Fachgebiete (FOK erman or English, deta	nours), details on av US Block Taught Sen	ailability to be anno ninar Interdisciplina	unced ry Research
		sessment (type, scope, lang le for bonus)	uage — if other than German, o	examination offered — if no	ot every semester, informat	ion on whether
1. Topic tes) c repo	cs cove or oral rt (app	as the following assess red in lectures and exe examination of one can rox. 8 pages) lk (approx. 30 to 45 mir	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 will t register for assessmer en assessment compon nodule, students must p	nt components 1 and 2 ents 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	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 wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 262 / 389

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Module title			Abbreviation			
FOKUS	Resea	rch Module Type VK12	Theoretical Physics		11-FM-VK12T-072-m	01
Module	coord	inator		Module offered by		
chairpe	rson o	f examination committe	20	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
12	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
cipline cies. Ap	of Theo oplicati	dvanced knowledge of pretical Physics, reprod on of the acquired prof e.g. experiments, case	uction of knowledge, a essional knowledge ar	equisition of social a	and methodological	competen-
Intende	ed lear	ning outcomes				
especia ply the	ally in t acquir	nave special and advar he specialist field of Th ed methods, to summa nplement the acquired	eoretical Physics, and rise a sub-area of the c	are able to reproduc current research area	e the acquired know in an oral presentat	ledge, to ap-
Course	S (type, r	umber of weekly contact hour	s, language — if other than Ge	rman)		
contact FOKUS contact	hours Kompa hours	rungsmodul Theoretisc) + Ü/P (2 weekly conta ktseminar Theoretisch), German or English, d semester break)	ct hours), details on av e Physik (FOKUS Block	vailability to be anno Taught Seminar The	unced oretical Physics): S (2 weekly
		essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informati	ion on whether
1. Topic tes) c repor	cs cove or oral rt (app	as the following asses red in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 mi	rcises: written examina didate each or oral exa			
Studen Details	ts mus on wh	omponents 1 and 2 wil t register for assessme en assessment compor odule, students must	nt components 1 and 2 ients 1 and 2 will be of	online (details to be fered to be announce	ed.	nt 2.
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	irs in				
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Module title			Abbreviation	
FOKUS Research Module Type VKM12A Astronomy			11-FM-VMK12A-072-m01	
Module coordinator			Module offered by	
chairperson of examination committee			Faculty of Physics a	nd Astronomy
ECTS Meth	od of grading	Only after succ. com	pl. of module(s)	
	erical grade			
Duration	Module level	Other prerequisites		
1 semester	graduate			
Contents				
cipline of Ast lication of the	ronomy, reproduction of k	nowledge, acquisition owledge and method	n of social and meth	search area, especially in the dis- nodological competencies. App- questions in a mini research pro-
Intended lear	ning outcomes			
especially in acquired met	the specialist field of Astr	onomy, and are able o-area of the current r	to reproduce the acc esearch area in an o	ork in a current research area, quired knowledge, to apply the ral presentation and to suc- oject.
Courses (type,	number of weekly contact hours, l	anguage — if other than Ger	man)	
(1 weekly con FOKUS Komp man or Englis mester break FOKUS Minifo	tact hour), details on avai aktseminar Astronomie (F sh, details on availability t)	ilability to be announ OKUS Block Taught S to be announced (blo mie (FOKUS Mini Rese	ced eminar Astronomy): ck taught seminar (3 earch Project Astrono	V (2 weekly contact hours) + Ü/P S (2 weekly contact hours), Ger- days), usually held during se- omy): P (2 weekly contact hours), rt time)
Method of as module is credita		ge — if other than German, e	examination offered — if no	t every semester, information on whether
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 				
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.				
Allocation of places				
Additional information				
Warkland				
Workload				
Teaching cyc	le			

Module appears in

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Module title				Abbreviation	
FOKUS Research Module Type VMK12D Didactics				11-FM-VMK12D-072-m01	
Module coordinator			Module offered by		
chairperson of examination of	committee		Faculty of Physics a	nd Astronomy	
ECTS Method of grading		Only after succ. com	pl. of module(s)		
12 numerical grade					
Duration Module level		Other prerequisites			
1 semester graduate					
Contents					
cipline of Didactics, reprodu	ction of kno ssional kno	owledge, acquisition wledge and methods	of social and metho	search area, especially in the dis- idological competencies. Appli- uestions in a mini research pro-	
Intended learning outcomes					
especially in the specialist fi	eld of Dida se a sub-ai	ctics, and are able to rea of the current res	reproduce the acquearch area in an oral	ork in a current research area, iired knowledge, to apply the ac- l presentation and to successful-	
Courses (type, number of weekly co				weekly contact hours) + Ü/P (1	
or English, details on availat break)	aktik (FOKl pility to be a kt Didaktik	JS Block Taught Sem announced (block tai (FOKUS Mini Researd	inar Didactics): S (2 ught seminar (3 days ch Project Didactics)	weekly contact hours), German s), usually held during semester : P (2 weekly contact hours), Ger- me)	
Method of assessment (type, s module is creditable for bonus)	scope, languag	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 					
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.					
Allocation of places					
Additional information					
Workload					
Teaching cycle					

Module appears in

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Module title			Abbreviation			
FOKUS Research Module Type VMK12E Experimental Physics			11-FM-VMK12E-072-	·m01		
Module coordinator		Module offered by				
chairpe	erson o	f examination committ	ee	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
12	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
cipline cies. Ap arch pr	of Expe oplicati oject (e	erimental Physics, repr on of the acquired pro e.g. experiments, case	independent scientific oduction of knowledge fessional knowledge ar studies etc.).	, acquisition of socia	al and methodologic	al competen-
Intende	ed lear	ning outcomes				
especia apply t	ally in t he acqu	he specialist field of Ex uired methods, to sum	nced knowledge of inde sperimental Physics, an marise a sub-area of th I knowledge and metho	d are able to reprod e current research a	uce the acquired kno rea in an oral presen	owledge, to
Course	S (type, r	umber of weekly contact hour	s, language — if other than Ge	rman)		
FOKUS contact ly held FOKUS weekly	Kompa t hours) during Minifor contac	ktseminar Experimente), German or English, d semester break) rschungsprojekt Experi t hours), German or En	ct hour), details on ava elle Physik (FOKUS Bloc etails on availability to mentelle Physik (FOKU glish, details on availa	ck Taught Seminar Ex be announced (bloc S Mini Research Proj bility to be announce	xperimental Physics) k taught seminar (3 ject Experimental Ph ed (approx. 3 weeks,	days), usual- ysics): P (2 , part time)
		i essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informati	on on whether
1. Topic tes) c repor 2. Semi	cs cove or oral rt (appi inar: ta		ercises: written examina ndidate each or oral exa nutes)			
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.						
Allocation of places						
Additional information						
Worklo	ad					
Teaching cycle						
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Module title			Abbreviation			
FOKUS Research Module Type VMK12I Interdisciplinary Research Fields			11-FM-VMK12I-072-m01			
Module coordinator		Module offered by				
chairpe	erson o	f examination committ	ee	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
12	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
discipli lication	nary su of the	ubjects, reproduction o	independent scientific f knowledge, acquisitic knowledge and methor etc.).	on of social and meth	hodological compete	encies. App-
Intende	ed lear	ning outcomes				
especia acquire	ally in i ed meth	nterdisciplinary specia nods, to summarise a s	nced knowledge of inde list fields, and are able ub-area of the current r owledge and methods	to reproduce the accessed on the accessed of the second of	quired knowledge, to oral presentation and	o apply the
Course	S (type, r	umber of weekly contact hour	s, language — if other than Gei	man)		
Fields): FOKUS Fields): minar (FOKUS search weeks, Methoo	V (2 w Kompa S (2 w 3 days) Minifor Fields) part tin	eekly contact hours) + ktseminar Interdiszipli eekly contact hours), G usually held during s rschungsprojekt Interd P (2 weekly contact h me)	linäre Fachgebiete (FO Ü/P (1 weekly contact H näre Fachgebiete (FOK German or English, deta emester break) isziplinäre Fachgebiete burs), German or Englis	our), details on ava US Block Taught Sen ils on availability to (FOKUS Mini Resear h, details on availab	ilability to be announ ninar Interdisciplinar be announced (bloc rch Project Interdisci pility to be announce	nced ry Research k taught se- plinary Re- d (approx. 3
This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3. Allocation of places Mdditional information Workload						
Teaching cycle						
Master's wi	ith 1 majo	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e aster (120 ECTS) FOKUS Phys	-	page 272 / 389

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	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation	
FOKUS Research Module Type VKM12T Theoretical Physics				11-FM-VMK12T-072-m01	
Module coordinator				Module offered by	
chairpe	erson of	f examination committee	_	Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
12	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
cipline cies. Ap arch pr	of Theo oplicati oject (e	oretical Physics, reproduc on of the acquired profes e.g. experiments, case stu	tion of knowledge, a ssional knowledge an	cquisition of social a	search area, especially in the dis- and methodological competen- cientific questions in a mini rese-
		ning outcomes			
especia ply the	ally in t acquire	he specialist field of Theo	pretical Physics, and see a sub-area of the c	are able to reproduc urrent research area	rork in a current research area, e the acquired knowledge, to ap- in an oral presentation and to n project.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
FOKUS contact ly held FOKUS	Kompa hours) during Minifor), German or English, deta semester break) rschungsprojekt Theoreti	Physik (FOKUS Block ails on availability to sche Physik (FOKUS I	Taught Seminar Theo be announced (bloc Mini Research Projec	nced oretical Physics): S (2 weekly k taught seminar (3 days), usual- tt Theoretical Physics): P (2 wee- approx. 3 weeks, part time)
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 					
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.					
Allocation of places					
Additional information					
Workload					
Teachir	Teaching cycle				
reaciiii	is cycli	G			

Module appears in

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Module title			Abbreviation		
FOKUS Research Module Type VKM13A Astronomy			11-FM-VMK13A-072-m01		
Module coordinator				Module offered by	
chairperson of examination committee				Faculty of Physics a	nd Astronomy
ECTS I	Method	l of grading	Only after succ. com	pl. of module(s)	
-		cal grade			
Duration	1 A	Module level	Other prerequisites		
1 semest	ter g	graduate			
Contents	S				
cipline o lication o	of Astror of the a	nomy, reproduction of k	nowledge, acquisitio owledge and method	n of social and meth	search area, especially in the dis- nodological competencies. App- juestions in a mini research pro-
Intended	d learni	ng outcomes			
especial acquired	lly in the d metho	e specialist field of Astro	onomy, and are able -area of the current r	to reproduce the acc esearch area in an o	rork in a current research area, quired knowledge, to apply the ral presentation and to suc- oject.
Courses	(type, nur	mber of weekly contact hours, la	anguage — if other than Ger	man)	
(1 weekly FOKUS K man or E mester b FOKUS N	y conta (ompak English, preak) Ainifors	ct hour), details on avai tseminar Astronomie (Fe details on availability t	lability to be announ OKUS Block Taught S o be announced (blo nie (FOKUS Mini Rese	ced eminar Astronomy): ck taught seminar (3 earch Project Astrono	V (3 weekly contact hours) + Ü/P S (2 weekly contact hours), Ger- days), usually held during se- omy): P (2 weekly contact hours), rt time)
Method module is c			ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topics tes) or report 2. Semin	 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 				
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.					
Allocation of places					
Additional information					
Workload					
Workload					
Teaching cycle					
reaching	g cycle				

Module appears in

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Module title					Abbreviation
FOKUS Research Module Type VMK13D Didactics				11-FM-VMK13D-072-m01	
Module coordinator A				Module offered by	
chairpe	erson of	f examination committee		Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
13	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
cipline cation o ject (e.s	c and a of Dida of the a g. expe	actics, reproduction of kn acquired professional kno riments, case studies etc	owledge, acquisition wledge and methods	of social and metho	search area, especially in the dis- odological competencies. Appli- uestions in a mini research pro-
		ning outcomes			
especia quired	ally in t methoo	he specialist field of Dida	actics, and are able to rea of the current res	reproduce the acque arch area in an oral	rork in a current research area, nired knowledge, to apply the ac- l presentation and to successful-
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
weekly contact hour), details on availability to be announced FOKUS Kompaktseminar Didaktik (FOKUS Block Taught Seminar Didactics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break) FOKUS Miniforschungsprojekt Didaktik (FOKUS Mini Research Project Didactics): P (2 weekly contact hours), Ger- man or English, details on availability to be announced (approx. 3 weeks, part time)					
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 					
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.					
Allocation of places					
Additional information					
Workload					
Teachir	ng cycl	e			

Module appears in

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	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation	
FOKUS Research Module Type VMK13E Experimental Physics			CS	11-FM-VMK13E-072-m01	
Module coordinator				Module offered by	
chairpe	rson of	f examination committee		Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
13	í – í	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme		graduate			
cipline cies. Ap	c and a of Expe	erimental Physics, reprod	uction of knowledge, ssional knowledge an	acquisition of socia	search area, especially in the dis- al and methodological competen- cientific questions in a mini rese-
Intende	ed learr	ning outcomes			
especia apply tl	ally in tl he acqu	he specialist field of Expe	erimental Physics, an arise a sub-area of the	d are able to reproduce and the second se	vork in a current research area, uce the acquired knowledge, to rea in an oral presentation and to h project.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
contact hours) + Ü/P (1 weekly contact hour), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usual- ly held during semester break) FOKUS Miniforschungsprojekt Experimentelle Physik (FOKUS Mini Research Project Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether					
		le for bonus)			,
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 					
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.					
Allocation of places					
Additional information					
 Workload					
worktoau					
Teachir	Teaching cycle				
	is cycli	u			

Module appears in

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Module title Abbreviation						
FOKUS Research Module Type VMK13I Interdisciplinary Research Fields 11-FM-VMK13I-072-m01					m01	
Module coordinator Module offered			Module offered by			
chairperson of examination committee Faculty of Physics and Astronomy			and Astronomy			
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
13	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
discipli lication	nary su of the	dvanced knowledge of ubjects, reproduction o acquired professional riments, case studies o	f knowledge, acquisition knowledge and metho	on of social and met	hodological compete	encies. App-
Intende	ed lear	ning outcomes				
especia acquire	ally in i d meth	have special and advar nterdisciplinary specia nods, to summarise a s ement the acquired kn	list fields, and are able ub-area of the current i	to reproduce the ac research area in an c	quired knowledge, to oral presentation and	o apply the
Course	S (type, r	number of weekly contact hour	s, language — if other than Ge	rman)		
 FOKUS Einführungsmodul Interdisziplinäre Fachgebiete (FOKUS Introductory Module Interdisciplinary Research Fields): V (3 weekly contact hours) + Ü/P (1 weekly contact hour), details on availability to be announced FOKUS Kompaktseminar Interdisziplinäre Fachgebiete (FOKUS Block Taught Seminar Interdisciplinary Research Fields): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break) FOKUS Miniforschungsprojekt Interdisziplinäre Fachgebiete (FOKUS Mini Research Project Interdisciplinary Research Fields): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether 						
		le for bonus)	,		,,	
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 						
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.						
Allocation of places						
Additional information						
Workload						
Teaching cycle						
						J
Master's wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • Naster (120 ECTS) FOKUS Phys	-	page 282 / 389

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Master's with 1 major FOKUS Physics (2010)		
Master's with 1 major FORUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 283 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title		Abbreviation		
FOKUS Research Module Type VKM13T Theoretical Physics				11-FM-VMK13T-072-m01
Module coordinator			Module offered by	
chairperson o	of examination committee		Faculty of Physics a	nd Astronomy
ECTS Meth	od of grading	Only after succ. com	npl. of module(s)	
13 nume	erical grade			
Duration	Module level	Other prerequisites		
1 semester	graduate			
Contents				
cipline of The cies. Applicat arch project (oretical Physics, reproduction of the acquired profester. e.g. experiments, case stu	ction of knowledge, a ssional knowledge an	cquisition of social a	search area, especially in the dis- and methodological competen- cientific questions in a mini rese-
	ning outcomes			
especially in ply the acqui	the specialist field of The	pretical Physics, and a sub-area of the c	are able to reproduc urrent research area	vork in a current research area, e the acquired knowledge, to ap- in an oral presentation and to n project.
Courses (type,	number of weekly contact hours, l	anguage — if other than Ger	man)	
contact hours) + Ü/P (1 weekly contact hour), details on availability to be announced FOKUS Kompaktseminar Theoretische Physik (FOKUS Block Taught Seminar Theoretical Physics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usual- ly held during semester break) FOKUS Miniforschungsprojekt Theoretische Physik (FOKUS Mini Research Project Theoretical Physics): P (2 wee- kly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time)				
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)				
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 				
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.				
Allocation of places				
Additional information				
Workload				
 Tooching are				
Teaching cyc	le			

Module appears in

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FOKUS Research Module Type VKM14A AstronomyIn FM-VMK14A-072-m01Module offered byConstruction committeeFaculty of Physics and AstronomyECTSMether of gradingOnly after succ. compl. of module(s)Image Intermediation committeeStation communication committeeModule levetOnly after succ. compl. of module(s)DurationModule levetOnly after succ. compl. of module(s)Duration of module levetOther prerequisitesSpecific and succed knowledge of independent scientific work in a current research area, especially in the discipline of Astronomy, reproduction of knowledge, acquisition of social and methodological competencies. Application of the second and methods to new scientific questions in a mini research project (e.g. experiments, case studies etc.)Interded terms worked ge of independent scientific work in a current research area, especially in the special and advanced knowledge of independent scientific work in a current research area, especially in the special and advanced knowledge of independent scientific work in a current research area, especially in the special and advanced knowledge of independent scientific work in a current research area, especial and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Astronomy, and are able to reproduce the acquired knowledge, to apply the acquired knowledge of independent scientific work in a mini research project.Course: (type. humber of weekly contact hours. Jaruage – if other than German<				
chairperson of examination committee Faculty of Physics and Astronomy ECTS Method of grading Only after succ. compl. of module(s) 14 numerical grade Duration Module level Other prerequisites 1 semester graduate Contents Specific and advanced knowledge of independent scientific work in a current research area, especially in the discipline of Astronomy, reproduction of knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge and methods to new scientific questions in a mini research project (e.g. experiments, case studies etc.). Intended learning outcomes The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Astronomy, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours, language — if other than German) FOKUS Einführungsmodul Astronomie (FOKUS Introductory Module Astronomy): V (3 weekly contact hours) + Ü/P (2 weekly contact hours), details on availability to be announced				
ECTS Method of grading Only after succ. compl. of module(s) 14 numerical grade Duration Module level Other prerequisites 1 semester graduate Contents Specific and advanced knowledge of independent scientific work in a current research area, especially in the discipline of Astronomy, reproduction of knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge and methods to new scientific questions in a mini research project (e.g. experiments, case studies etc.). Intended learning outcomes The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Astronomy, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours, language – if other than German) FOKUS Einführungsmodul Astronomie (FOKUS Introductory Module Astronomy): V (3 weekly contact hours) + Ü/P (2 weekly contact hours), details on availability to be announced				
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Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)				
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 				
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.				
Allocation of places				
Additional information				
Workload				
Teaching cycle				

Module appears in

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Module title					Abbreviation
FOKUS Research Module Type VMK14D Didactics 11-FM-VMK14D-072-m01					11-FM-VMK14D-072-m01
Module coordinator				Module offered by	
chairpe	rson of	examination committee		Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
14	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
cipline cation c	of Dida of the a	ctics, reproduction of kn	owledge, acquisition wledge and methods	of social and metho	search area, especially in the dis- idological competencies. Appli- uestions in a mini research pro-
Intende	ed learr	ning outcomes			
especia quired I ly imple	ally in the second s Second second s Second second s	he specialist field of Dida ls, to summarise a sub-a he acquired knowledge a	actics, and are able to rea of the current res and methods in a min	reproduce the acque earch area in an oral i research project.	vork in a current research area, iired knowledge, to apply the ac- l presentation and to successful-
		umber of weekly contact hours, l			
FOKUS Einführungsmodul Didaktik (FOKUS Introductory Module Didactics): V (3 weekly contact hours) + Ü/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Didaktik (FOKUS Block Taught Seminar Didactics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break) FOKUS Miniforschungsprojekt Didaktik (FOKUS Mini Research Project Didactics): P (2 weekly contact hours), Ger- man or English, details on availability to be announced (approx. 3 weeks, part time)					
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
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Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.					
Allocation of places					
Additional information					
Workload					
Teachir	ng cycl	9			

Module appears in

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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 289 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	title				Abbreviation
FOKUS	Resear	rch Module Type VMK14E	Experimental Physic	:5	11-FM-VMK14E-072-m01
Module	coord	inator		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)	
14		rical grade			
Duratio		Module level	Other prerequisites		
1 seme		graduate			
cipline cies. Ap	c and a of Expe oplicati	erimental Physics, reprod	uction of knowledge, ssional knowledge an	acquisition of socia	search area, especially in the dis- Il and methodological competen- cientific questions in a mini rese-
Intende	ed learr	ning outcomes			
especia apply th	ally in t ne acqu	he specialist field of Expe	erimental Physics, an arise a sub-area of the	d are able to reprodue current research ar	York in a current research area, uce the acquired knowledge, to rea in an oral presentation and to n project.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
FOKUS contact ly held FOKUS weekly	Kompa hours) during Minifor contac), German or English, det semester break) rschungsprojekt Experim t hours), German or Engli	e Physik (FOKUS Bloc ails on availability to entelle Physik (FOKUS sh, details on availal	k Taught Seminar Ex be announced (bloc S Mini Research Proj pility to be announce	xperimental Physics): S (2 weekly k taught seminar (3 days), usual- ect Experimental Physics): P (2 ed (approx. 3 weeks, part time)
		ESSMENT (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repor 2. Semi	cs cove or oral o rt (appr nar: ta		ises: written examina idate each or oral exa tes)		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Details	ts mus [.] on whe	omponents 1 through 3 w t register for assessment en assessment compone rodule, students must pa	components 1 throug nts 1 through 3 will be	gh 3 online (details t e offered to be anno	unced.
Allocat	ion of p	olaces			
Additio	nal info	ormation			
 Worklo	ad				
Teachir	ng cycl	e			
	5,2				

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 291 / 389
	data margin Marsten (see ECTC) EQUILE Disusity and	
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
FOKUS	Resea	rch Module Type VMK1	4I Interdisciplinary Re	search Fields	11-FM-VMK14I-072-	m01
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committ	ee	Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
14	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i		
1 seme	ster	graduate				
Conten	ts					
discipli licatior	inary ຣເ າ of the	ubjects, reproduction o	independent scientific f knowledge, acquisitic knowledge and metho etc.).	on of social and metl	hodological compete	encies. App-
Intende	ed lear	ning outcomes				
especia acquire	ally in i ed meth	nterdisciplinary specia nods, to summarise a s	nced knowledge of inde list fields, and are able ub-area of the current r owledge and methods	to reproduce the ac research area in an c	quired knowledge, to oral presentation and	o apply the
Course	S (type, r	umber of weekly contact hour	s, language — if other than Ge	rman)		
Fields): FOKUS Fields): minar (FOKUS	: V (3 w Kompa : S (2 w (3 days) Minifor Fields)	eekly contact hours) + ktseminar Interdiszipl eekly contact hours), (, usually held during s rschungsprojekt Interd : P (2 weekly contact h	olinäre Fachgebiete (FO Ü/P (2 weekly contact inäre Fachgebiete (FOK German or English, deta emester break) isziplinäre Fachgebiete ours), German or Englis	hours), details on av US Block Taught Ser ils on availability to (FOKUS Mini Resea	ailability to be anno ninar Interdisciplina be announced (bloc rch Project Interdisci	unced ry Research k taught se- plinary Re-
		essment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	ot every semester, informati	ion on whether
1. Topio tes) repo 2. Sem	cs cove or oral rt (appi inar: ta		ercises: written examina ndidate each or oral exa nutes)			
Studen Details	its mus on wh	t register for assessme en assessment compo	will be offered in Gern nt components 1 throu nents 1 through 3 will b pass each of the asses	gh 3 online (details t e offered to be anno	unced.	
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Master's w	ith 1 majo	r FOKUS Physics (2010)		• egenerated 26-Aug-2024 • • Naster (120 ECTS) FOKUS Phys		page 292 / 389

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 293 / 389
		10. /2/2./
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	title				Abbreviation
FOKUS	Resear	rch Module Type VKM14T	Theoretical Physics		11-FM-VMK14T-072-m01
Module	coord	inator		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)	
14	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
cipline cies. Ap arch pr	of Theo oplicati oject (e	oretical Physics, reproduct on of the acquired profest e.g. experiments, case stu	tion of knowledge, a ssional knowledge an	cquisition of social a	search area, especially in the dis- and methodological competen- cientific questions in a mini rese-
		ning outcomes			
especia ply the	ally in th acquire	he specialist field of Theo	pretical Physics, and see a sub-area of the c	are able to reproduc urrent research area	rork in a current research area, e the acquired knowledge, to ap- in an oral presentation and to n project.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
FOKUS contact ly held FOKUS	Kompa hours) during Minifor), German or English, det semester break) rschungsprojekt Theoreti	Physik (FOKUS Block ails on availability to sche Physik (FOKUS I	Taught Seminar Theo be announced (bloc Mini Research Projec	unced oretical Physics): S (2 weekly k taught seminar (3 days), usual- tt Theoretical Physics): P (2 wee- approx. 3 weeks, part time)
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repor 2. Semi	cs cove or oral o rt (appr nar: ta		ises: written examina idate each or oral exa tes)		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Details	ts mus on whe s this m	omponents 1 through 3 w t register for assessment en assessment compone odule, students must pa	components 1 throug nts 1 through 3 will b	gh 3 online (details t e offered to be anno	unced.
milotal		παιεσ			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cvcl	e			
	-5 -9-0	-			
			-		

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 295 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation
FOKUS Researc	h Module Type VKM16A	Astronomy		11-FM-VMK16A-072-m01
Module coordin	nator		Module offered by	
chairperson of e	examination committee		Faculty of Physics a	nd Astronomy
ECTS Method	l of grading	Only after succ. com	pl. of module(s)	
16 numerio	cal grade			
Duration N	Nodule level	Other prerequisites		
1 semester او	graduate			
Contents				
cipline of Astron lication of the a	nomy, reproduction of k	nowledge, acquisitio owledge and method	n of social and meth	search area, especially in the dis- nodological competencies. App- nuestions in a mini research pro-
Intended learni	ng outcomes			
especially in the acquired metho	e specialist field of Astro	onomy, and are able -area of the current r	to reproduce the acc esearch area in an o	ork in a current research area, quired knowledge, to apply the ral presentation and to suc- oject.
Courses (type, nur	mber of weekly contact hours, la	anguage — if other than Ger	man)	
FOKUS Kompak man or English, mester break) FOKUS Minifors	, details on availability t	OKUS Block Taught S o be announced (blo nie (FOKUS Mini Rese	eminar Astronomy): ck taught seminar (3 earch Project Astrono	S (2 weekly contact hours), Ger- days), usually held during se- omy): P (2 weekly contact hours), rt time)
Method of asse module is creditable		ge — if other than German, e	xamination offered — if no	t every semester, information on whether
 Topics covere tes) or oral ex report (appro 2. Seminar: talk 	xamination of one candi	ises: written examina date each or oral exa tes)		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Students must Details on wher To pass this mo	mponents 1 through 3 w register for assessment n assessment compone odule, students must pa	components 1 throug nts 1 through 3 will be	sh 3 online (details to e offered to be annot	unced.
Allocation of pla	aces			
Additional infor	rmation			
Workload				
Teaching cycle				

Module appears in

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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 297 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation
FOKUS Research Module Type VMK16	D Didactics		11-FM-VMK16D-072-m01
Module coordinator		Module offered by	
chairperson of examination committe	e	Faculty of Physics a	nd Astronomy
ECTS Method of grading	Only after succ. com	pl. of module(s)	
16 numerical grade			
Duration Module level	Other prerequisites		
1 semester graduate			
Contents			
Specific and advanced knowledge of cipline of Didactics, reproduction of k cation of the acquired professional kr ject (e.g. experiments, case studies e	nowledge, acquisition lowledge and method	of social and metho	dological competencies. Appli-
Intended learning outcomes			
The students have special and advan especially in the specialist field of Dic quired methods, to summarise a sub- ly implement the acquired knowledge	lactics, and are able to area of the current res	o reproduce the acquearch area in an ora	ired knowledge, to apply the ac-
Courses (type, number of weekly contact hours	language — if other than Ger	man)	
FOKUS Einführungsmodul Didaktik (FO weekly contact hours), details on ava FOKUS Kompaktseminar Didaktik (FO or English, details on availability to bo break) FOKUS Miniforschungsprojekt Didakti man or English, details on availability	lability to be announc KUS Block Taught Sem e announced (block ta k (FOKUS Mini Resear	ed inar Didactics): S (2 ught seminar (3 days ch Project Didactics)	weekly contact hours), German s), usually held during semester : P (2 weekly contact hours), Ger-
Method of assessment (type, scope, langumodule is creditable for bonus)	age — if other than German, o	examination offered — if no	t every semester, information on whether
 This module has the following assess Topics covered in lectures and exertes) or oral examination of one can report (approx. 8 pages) Seminar: talk (approx. 30 to 45 min 3. Research project: project report (approx) 	cises: written examina didate each or oral exa utes)		
Assessment components 1 through 3 Students must register for assessmer Details on when assessment compon To pass this module, students must p	t components 1 throug ents 1 through 3 will b	gh 3 online (details t e offered to be anno	unced.
Allocation of places			
	_		
Additional information			
Workload			
Teaching cycle			

Module appears in

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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 299 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

FOKUS Research Module Type VMK16E Experimental Physics: 11-FM-VMK16E-072-m01 Module cordination committee Faculty of Physics and Astronomy Contentation committee Faculty of Physics and Astronomy ECTS Module for grading Only after succ. compl. of module(s) 16 numerical grade - Contents Specific and advanced knowledge of independent scientific work in a current research area, especially in the discipline of Experimental Physics, reproduction of knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge of independent scientific work in a current research area, especially in the discipline of Experimental Physics, case studies etc.). Intended learning outcomes The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Experimental Physics, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a min research project. Contents Contents Contents <
chairperson of examination committee Faculty of Physics and Astronomy ECTS Method of grading Only after succ. compl. of module(s) 16 numerical grade Duration Module level Other prerequisites 1 semester graduate Contents Specific and advanced knowledge of independent scientific work in a current research area, especially in the discipline of Experimental Physics, reproduction of knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge and methods to new scientific questions in a mini research project (e.g. experiments, case studies etc.). Intended learning outcomes The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Experimental Physics, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Introductory Module Experimental Physics): V (4 weekly contact hours) + U/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 da
ECTS Method of grading Only after succ. compl. of module(s) 16 numerical grade Duration Module level Other prerequisites 1 semester graduate Contents Specific and advanced knowledge of independent scientific work in a current research area, especially in the discipline of Experimental Physics, reproduction of knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge and methods to new scientific questions in a mini research project (e.g. experiments, case studies etc.). Intended learning outcomes The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Experimental Physics, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours, language – if other than German) FOKUS Kompaktseminar Experimentelle Physik (FOKUS Introductory Module Experimental Physics): V (4 weekly contact hours) + U/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break) FOKUS Kin
16 numerical grade Duration Module level Other prerequisites 1 semester graduate Contents Specific and advanced knowledge of independent scientific work in a current research area, especially in the discipline of Experimental Physics, reproduction of knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge and methods to new scientific questions in a mini research project (e.g. experiments, case studies etc.). Intended learning outcomes The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Experimental Physics, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours, language – if other than German) FOKUS Einführungsmodul Experimentelle Physik (FOKUS Introductory Module Experimental Physics): V (4 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break) FOKUS Miniforschungsprojekt Experimentelle Physik (FOKUS Mini Research Project Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time)
Duration Module level Other prerequisites 1 semester graduate Contents Specific and advanced knowledge of independent scientific work in a current research area, especially in the discipline of Experimental Physics, reproduction of knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge and methods to new scientific questions in a mini research project (e.g. experiments, case studies etc.). Intended learning outcomes The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Experimental Physics, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours, language – if other than German) FOKUS Einführungsmodul Experimentelle Physik (FOKUS Introductory Module Experimental Physics): V (4 weekly contact hours), + Ü/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): S (2 weekly contact hours), German or English, details on availability to be announced FOKUS Miniforschungsprojekt Experimentelle Physik (FOKUS Mini Research Project Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time)
1 semester graduate
Contents Specific and advanced knowledge of independent scientific work in a current research area, especially in the discipline of Experimental Physics, reproduction of knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge and methods to new scientific questions in a mini research project (e.g. experiments, case studies etc.). Intended learning outcomes The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Experimental Physics, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours, language — if other than German) FOKUS Einführungsmodul Experimentelle Physik (FOKUS Introductory Module Experimental Physics): V (4 weekly contact hours), 4 U/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): S (2 weekly contact hours), German or English, details on availability to be announced FOKUS Miniforschungsprojekt Experimentelle Physik (FOKUS Mini Research Project Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time) Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
Specific and advanced knowledge of independent scientific work in a current research area, especially in the discipline of Experimental Physics, reproduction of knowledge, acquisition of social and methodological competencies. Application of the acquired professional knowledge and methods to new scientific questions in a mini research project (e.g. experiments, case studies etc.). Intended learning outcomes The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Experimental Physics, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours, language – if other than German) FOKUS Einführungsmodul Experimentelle Physik (FOKUS Introductory Module Experimental Physics): V (4 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break) FOKUS Miniforschungsprojekt Experimentelle Physik (FOKUS Mini Research Project Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)
The students have special and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Experimental Physics, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours, language – if other than German) FOKUS Einführungsmodul Experimentelle Physik (FOKUS Introductory Module Experimental Physics): V (4 weekly contact hours) + Ü/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break) FOKUS Miniforschungsprojekt Experimentelle Physik (FOKUS Mini Research Project Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)
especially in the specialist field of Experimental Physics, and are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub-area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project. Courses (type, number of weekly contact hours, language – if other than German) FOKUS Einführungsmodul Experimentelle Physik (FOKUS Introductory Module Experimental Physics): V (4 weekly contact hours) + Ü/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usual- ly held during semester break) FOKUS Miniforschungsprojekt Experimentelle Physik (FOKUS Mini Research Project Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)
 FOKUS Einführungsmodul Experimentelle Physik (FOKUS Introductory Module Experimental Physics): V (4 weekly contact hours) + Ü/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break) FOKUS Miniforschungsprojekt Experimentelle Physik (FOKUS Mini Research Project Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)
contact hours) + Ü/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Experimentelle Physik (FOKUS Block Taught Seminar Experimental Physics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usual- ly held during semester break) FOKUS Miniforschungsprojekt Experimentelle Physik (FOKUS Mini Research Project Experimental Physics): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)
module is creditable for bonus)
This module has the following assessment components
 Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) Seminar: talk (approx. 30 to 45 minutes) Research project: project report (approx. 8 pages)
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.
Allocation of places
Additional information
Workload
Teaching cycle

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 301 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
FOKUS	Resea	rch Module Type VMK1	6I Interdisciplinary Re	search Fields	11-FM-VMK16I-072-	m01
Module	e coord	inator		Module offered by	<u> </u>	
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)		
16	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
discipli lication	inary ຣເ າ of the	ubjects, reproduction o	independent scientific f knowledge, acquisitio knowledge and metho etc.).	on of social and meth	nodological compete	encies. App-
Intende	ed lear	ning outcomes				
especia acquire	ally in i ed meth	nterdisciplinary specia nods, to summarise a s	nced knowledge of inde list fields, and are able ub-area of the current i owledge and methods	to reproduce the ac research area in an o	quired knowledge, to ral presentation and	o apply the
Course	S (type, r	number of weekly contact hour	s, language — if other than Ge	rman)		
 FOKUS Einführungsmodul Interdisziplinäre Fachgebiete (FOKUS Introductory Module Interdisciplinary Research Fields): V (4 weekly contact hours) + Ü/P (2 weekly contact hours), details on availability to be announced FOKUS Kompaktseminar Interdisziplinäre Fachgebiete (FOKUS Block Taught Seminar Interdisciplinary Research Fields): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break) FOKUS Miniforschungsprojekt Interdisziplinäre Fachgebiete (FOKUS Mini Research Project Interdisciplinary Research Fields): P (2 weekly contact hours), German or English, details on availability to be announced (approx. 3 weeks, part time) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether 						
module is	s creditab	le for bonus)				
1. Topic tes) (repo 2. Semi 3. Rese	 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 					
Studen Details	ts mus on wh	t register for assessme en assessment compo	will be offered in Gern nt components 1 throu nents 1 through 3 will b pass each of the asses	gh 3 online (details t e offered to be anno	unced.	
Allocat	ion of _l	olaces				
Additional information						
Workload						
Teachir	ng cycl	e				
Master's wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • 6 laster (120 ECTS) FOKUS Phys	-	page 302 / 389

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 303 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	title				Abbreviation
FOKUS Research Module Type VKM16T Theoretical Physics				11-FM-VMK16T-072-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)	
16	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
cipline cies. Ap arch pro	of Theo oplicati oject (e	oretical Physics, reproduct on of the acquired profest e.g. experiments, case stu	tion of knowledge, a ssional knowledge an	cquisition of social a	search area, especially in the dis- and methodological competen- cientific questions in a mini rese-
		ning outcomes			
especia ply the	ally in th acquire	he specialist field of Theo	pretical Physics, and a sub-area of the c	are able to reproduc urrent research area	rork in a current research area, e the acquired knowledge, to ap- in an oral presentation and to n project.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
FOKUS contact ly held FOKUS	Kompa hours) during Minifor), German or English, det semester break) rschungsprojekt Theoreti	Physik (FOKUS Block ails on availability to sche Physik (FOKUS I	Taught Seminar Theo be announced (bloc Mini Research Projec	unced oretical Physics): S (2 weekly k taught seminar (3 days), usual- tt Theoretical Physics): P (2 wee- approx. 3 weeks, part time)
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 					
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 1 through 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.					
Allocation of places					
	Additional information				
Worklo	Workload				
Teachir	ng cycl	P			
	-5 cycli				
			-		

Module appears in

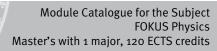
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Module title			Abbreviation		
FOKUS	Resea	rch Module Topological I	nsulators		11-FM-TI-131-m01
Module coordinator				Module offered by	
chairpe	erson o	f examination committee		Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
					ties. In this research module, we the basis of current research re-
Intende	ed lear	ning outcomes			
sulator	s, and		acquired knowledge	, to apply the acquir	ork in the field of topological in- ed methods and to summarise a
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)	
kly con Kompa hours),	tact ho ktsemi Germa	urs) + Ü/P (1 weekly cont nar Topologische Isolator	act hour), German or ren (Block Taught Ser vailability to be anno	English, once a year ninar Topological Ins ounced (block taught	sulators): S (2 weekly contact : seminar (1 to 3 days) held to-
				•	t every semester, information on whether
		le for bonus)			
1. Topio tes) repo	cs cove or oral rt (app		ises: written examina idate each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Assess ponent	ts mus ment c 2 will	omponents 1 and 2 will b t register for assessment omponent 1 will be offere be offered to be announc nodule, students must pa	components 1 and 2 ed once a year in the s ed.	online (details to be summer semester; d	etails on when assessment com-
Allocat	ion of _l	olaces			
Additio	nal inf	ormation			
Workload					
Teachi	ng cycl	e			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	nrs in			
Bachel	or' deg	ree (1 major) Nanostructu	re Technology (2010))	

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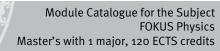
Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011)

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Module	title				Abbreviation
FOKUS Research Module Experimental Particle Physics				11-FM-TPE-092-m01	
Module	coord	inator		Module offered by	
chairpe	rson of	f examination committee		Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
8	1	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme		graduate	11-KET; recommende	ed: 11-DTS, 11-TPS	
cipline compet	c and a of Expe encies	erimental Particle Physics . Application of the acqui	, reproduction of kno	wledge, acquisition	search area, especially in the dis- of social and methodological s to new scientific questions.
		ning outcomes			
especia	ally in th	he field of Experimental F	Particle Physics, and	are able to reproduc	vork in a current research area, e the acquired knowledge, to ap- area in an oral presentation.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
tact hou Kompal kly cont	ur), Ger ktsemii tact ho	rman or English, once a y nar Experimentelle Teilch	ear (details to be ann enphysik (Block Taug	iounced) ght Seminar Experim	act hours) + Ü/P (1 weekly con- nental Particle Physics): S (2 wee- plock taught seminar (3 days),
Method	l of ass		ge — if other than German, e	examination offered — if no	ot every semester, information on whether
1. Topic tes) c repoi	s cove or oral e t (appr		ises: written examina idate each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Assessi compor	ts musi ment co nent 2 v	omponents 1 and 2 will b t register for assessment omponent 1 will be offere will be offered to be anno odule, students must pa	components 1 and 2 ed once a year (detail ounced.	online (details to be s to be announced);	details on when assessment
Allocat	ion of p	olaces			
 Additio	nalinf	ormation			
Auditio					
Workload					
WUIKIU	au				
Teachir		2			
	-5 cycli				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
Module	annea	ins in			
Module appears in Master's degree (1 major) FOKUS Physics (2010)					

Master's with 1 major FOKUS Physics (2010)

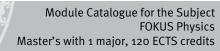




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Module	title				Abbreviation
FOKUS Research Module Semiconductor Lasers			11-FM-HLF-092-m01		
Module	coord	inator		Module offered by	
chairpe	rson o	f examination committee	_	Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
					search area, especially in the dis- al and methodological competen-
Intende	ed learn	ning outcomes			
especia	ally in t		r lasers, and are able	to reproduce the ac	ork in a current research area, quired knowledge, to apply the an oral presentation.
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
(3 week Kompal	dy cont ktsemi Englisł	act hours) + Ü/P (1 week nar Halbleiterlaser (Block	ly contact hour), Gerr Taught Seminar Sen	nan or English, once niconductor Lasers):	inciples and Current Research): V a year (summer semester) S (2 weekly contact hours), Ger- days), usually held during se-
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repor	s cove or oral e t (appr		ises: written examina idate each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Assessi ponent	ts mus ment co 2 will b	omponents 1 and 2 will b t register for assessment omponent 1 will be offere be offered to be announc odule, students must pa	components 1 and 2 ed once a year in the s ed.	online (details to be summer semester; d	etails on when assessment com-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
Module	appea	in and a second s			
Master'	Master's degree (1 major) FOKUS Physics (2010)				





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Module title			Abbreviation			
FOKUS	Resear	ch Module Applied Se	miconductor Physics		11-FM-AHL-092-mo	L
Module	coord	inator		Module offered by		
chairpe	rson of	examination committe	20	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate	Festkörperphysik 1 (Solid State Physics	1)	
Conten	ts					
of the n	nain co		r independent scientifi cs, optoelectronics and cencies.			
Intende	ed learr	ning outcomes				
Physics and pho perties. conduc	a. They ononic . They k tors an	are familiar with the pr band structures of imp mow the realisation po d their technological ir	nced knowledge of inde operties of semiconduc ortant semiconductors ssibilities of low-dimen nportance. They have a ge in an oral presentat	ctors, they have gain and the resulting el nsional charge carrie acquired advanced k	ed an overview of th ectronic, optical and r systems on the bas	e electronic I thermal pro- sis of semi-
Course	S (type, n	umber of weekly contact hour	s, language — if other than Ger	rman)		
tact hou Kompal weekly days), t	ur), Ger ktsemi contac usually	man or English, once a nar Angewandte Halble t hours), German or En held during semester l	1) ht Seminar Applied S bility to be announce	Semiconductor Physi ed (block taught sem	ics): S (2 1inar (3
		essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
1. Topic tes) c repor	cs cove or oral e rt (appr		rcises: written examina didate each or oral exa			
Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Assessment component 1 will be offered once a year in the winter semester; details on when assessment compo- nent 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.						
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
Teachir	ng cycl	9				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
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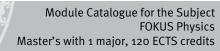
Module appears in

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Module	title				Abbreviation
FOKUS	Resea	rch Module Theory of Sup	perconductivity		11-FM-TSL-092-m01
Module	coord	inator		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)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
					search area, especially in the dis- nd methodological competen-
Intende	d lear	ning outcomes			
especia	lly in t	he field of the theory of s	uperconductivity, and	d are able to reprodu	rork in a current research area, uce the acquired knowledge, to h area in an oral presentation.
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
Germar Kompal tact hou	i or Eng ktsemi urs), Ge	glish, once a year (summ nar Theorie der Supraleit	er semester) ung (Block Taught Se	minar Theory of Sup	s) + Ü/P (1 weekly contact hour), erconduction): S (2 weekly con- ught seminar (3 days), usually
			ge — if other than German, e	examination offered — if no	t every semester, information on whether
		le for bonus)			
1. Topic tes) c repor	s cove or oral o t (appi		ises: written examina idate each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Assessi ponent	ts mus nent c 2 will l	omponents 1 and 2 will b t register for assessment omponent 1 will be offere be offered to be announc nodule, students must pa	components 1 and 2 ed once a year in the s ed.	online (details to be summer semester; d	etails on when assessment com-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ıg cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	ars in			
		ee (1 major) FOKUS Physi	cs (2010)		

Master's with 1 major FOKUS Physics (2010)

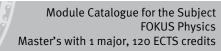




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Module	title				Abbreviation	
FOKUS Research Module Theoretical Solid State Physics 11-FM-TFK-092-m01			11-FM-TFK-092-m01			
Module	coord	inator		Module offered by		
chairpe	rson o	f examination committee		Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate	Recommended: 11-K	M, 11-TQM		
Conten	ts					
	of Theo	oretical Solid-State Physic			search area, especially in the dis- n of social and methodological	
Intende	ed learn	ning outcomes				
especia	ally in t	he field of Theoretical So	lid-State Physics, and	are able to reprodu	rork in a current research area, ice the acquired knowledge, to h area in an oral presentation.	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
tact hou Kompal weekly	urs), Ge ktsemi contac	erman or English, once a nar Theoretische Festkörp	year (winter semeste berphysik (Block Taug sh, details on availal	r) ght Seminar Theoret	ntact hours) + Ü/P (2 weekly con- ical Solid State Physics): S (2 ed (block taught seminar (3	
		-		warmination offered if no	t every semester, information on whether	
		le for bonus)	ge — II other than German, e	xammation onered — If no	it every semester, information on whether	
1. Topic tes) c repor	s cove or oral e t (appr		ises: written examina date each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project	
Studen Assessi nent 2 v	ts mus [.] ment co will be	omponents 1 and 2 will b t register for assessment omponent 1 will be offere offered to be announced nodule, students must pa	components 1 and 2 d once a year in the v	online (details to be winter semester; det	ails on when assessment compo-	
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
Teachir	ng cycl	е				
Referre	d to in	LPO I (examination regulations	for teaching-degree progra	mmes)		
Module	appea	in				
		ee (1 major) FOKUS Physi	cs (2010)			

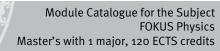




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Modul	e title				Abbreviation	
FOKUS	Resea	rch Module Theoretical	Astrophysics		11-FM-AST-092-mo1	L
Modul	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	Faculty of Physics a	ind Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ester	graduate		lynamics, programm rticle physics, therm	-	ended: ato-
Conter	nts					
plex of		dvanced knowledge of ion results; numeric sim ncies.				
Intend	ed lear	ning outcomes				
They have the second se	ave bas s and to	have special and advan sic knowledge of the me o test the models with th eir knowledge in an ora	thods of Theoretical A ne help of simulations	strophysics. They are	e able to design com	plex obser-
Course	S (type, r	number of weekly contact hours	, language — if other than Ge	rman)		
Kompa hours)	ıktsemi , Germa	Astrophysik (Theoretica nar Theoretische Astrop an or English, details on ter break)	hysik (Block Taught S	eminar Theoretical A	strophysics): S (2 we	eekly contact
Metho	d of ass	Sessment (type, scope, lang	uage — if other than German,	examination offered — if no	ot every semester, informati	ion on whether
		le for bonus)			-	
1. Topi tes) repo	cs cove or oral ort (app	as the following assess red in lectures and exer examination of one can rox. 8 pages) lk (approx. 30 to 45 mir	rcises: written examina didate each or oral exa			-
		omponent 2 will be offe				
		t register for assessmer en assessment compon			e announced).	
		nodule, students must p			sessment componer	nt 2.
Allocat	tion of _l	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	ammes)		
		-				
Modul	e appea	ars in				
		ee (1 major) FOKUS Phy	sics (2010)			
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Module title			Abbreviation			
FOKUS	Resea	rch Spintronic and Phy	sics		11-FM-LHQ-092-mo	1
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	ee	Faculty of Physics a	nd Astronomy	
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	graduate				
Conten	ts					
special	Specific and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Spintronics and Nanophysics, reproduction of knowledge, acquisition of social and methodo-logical competencies.					
Intende	ed lear	ning outcomes				
especia	The students have special and advanced knowledge of independent scientific work in a current research area, especially in the field of spintronics and Nanophysics, and are able to reproduce the acquired knowledge, to apply the acquired methods and to summarise a sub-area of the current research area in an oral presentation.					
Course	S (type, r	umber of weekly contact hour	s, language — if other than Gei	rman)	· · ·	
tor Tecl man or Kompa contact	hnolog Englisl ktsemi t hours	y and Theory of Quantu n, once a year (winter s nar Spintronik und Nar	ertechnik und Theorie m Transport): V (3 wee emester) ophysik (Block Taught etails on availability to	kly contact hours) + Seminar Spintronics	Ü/P (1 weekly contacts and Nanophysics):	ct hour), Ger- S (2 weekly
Method	d of ass		uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
1. Topio tes) (repo	cs cove or oral rt (appi		rcises: written examina adidate each or oral exa			
Studen Assess nent 2 To pass	ts mus ment c will be s this m	t register for assessme omponent 1 will be offe offered to be announce odule, students must	l be offered in German nt components 1 and 2 ered once a year in the ed. pass both assessment	online (details to be winter semester; det	ails on when assess	
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	mmes)		
Module	e appea	in in				
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Module	title				Abbreviation	
FOKUS	Resear	rch Module Relativistic	Quantum Field Theory		11-FM-RQFT-092-mc)1
Module	coord	inator		Module offered by		
chairperson of examination committee		ee	Faculty of Physics a	nd Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
12	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semestergraduateLectures Theoretische Physik (Theoretical Physics); Quantenmechanik (Quantum Mechanics 2) recommended.			mechanik 2			
Content	ts					
Field Th	ieory. S on theo	Symmetries, Lagrange f Pry, Feynman rules, qua	independent scientific ormalism for fields, fie ntum electrodynamic p	ld quantisation, gaug	ge principle and inte	raction, per-
Intende	ed leari	ning outcomes				
quantu	m field e to ap	theory. They know the ply perturbation theory	nced knowledge of inde principles and mathen and Feyman rules. The	natical basics of rela	tivistic quantum fiel	d theory and
Courses	5 (type, n	umber of weekly contact hour	s, language — if other than Gei	rman)		
kly cont Kompal (2 week 3 days)	tact ho ktsemi kly cont held to	urs), German or Englisl nar Relativistische Qua act hours), German or owards the end of sem	Relativistic Quantum Fig n, once a year (winter s ntenfeldtheorie (Block English, details on ava ester break or at the be	emester) Taught Seminar Rela ilability to be annou ginning of the subse	ativistic Quantum Fie nced (block taught s equent semester)	eld Theory): S eminar (1 to
		s essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
1. Topic tes) c repor	s cove or oral o t (appi		rcises: written examina didate each or oral exa			
Student Assessi nent 2 v	ts mus ment c will be	t register for assessme omponent 1 will be offe offered to be announce	be offered in German nt components 1 and 2 ered once a year in the ed. bass both assessment	online (details to be winter semester; det	ails on when assess	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachin	ng cycl	e				
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	mmes)		
		-				
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	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	title				Abbreviation	
FOKUS	Resear	ch Module Relativistic	Quantum Field Theory	with Mini Research	11-FM-RQFT-MF-0	92-m01
Project					-	
Module	coord	inator		Module offered by		
chairpe	erson of	f examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS		od of grading	Only after succ. con			
16		rical grade				
Duratio	r	Module level	Other prerequisites			
1 semes		graduate	Lectures Theoretisc	he Physik (Theoretica cs 2) recommended.	al Physics); Quant	enmechanik 2
Conten	l			cs z) recommended.		
Field Th	neory. S on theo	dvanced knowledge of Symmetries, Lagrange fo ry, Feynman rules, qua isation.	ormalism for fields, fie	ld quantisation, gaug	ge principle and ir	iteraction, per-
Intende	ed learr	ning outcomes				
quantu are able an oral	m field e to apj presen	have special and advan theory. They know the ply perturbation theory tation. They are able to pwn the results in a rep	principles and mathen and Feyman rules. The successfully impleme	natical basics of rela ey are able to summa	tivistic quantum fi rise the acquired	eld theory and knowledge in
Course	S (type, n	umber of weekly contact hours	, language — if other than Gei	rman)		
(2 week 3 days) Minifors Theory) taught	cly cont held to schung P (2 w during	nar Relativistische Qua cact hours), German or l owards the end of seme (sprojekt Relativistische veekly contact hours), G semester break or appr sessment (type, scope, lange	English, details on ava ester break or at the be e Quantenfeldtheorie (German or English, deta ox. 3 weeks part time)	ilability to be annour ginning of the subse Mini Research Projec ails on availability to	nced (block taugh quent semester) t Relativistic Quar be announced (ei	t seminar (1 to ntum Field ither block
This mo 1. Topic tes) o repor 2. Semi	odule h cs cove or oral e rt (appr inar: ta	le for bonus) as the following assess red in lectures and exer examination of one can rox. 8 pages) lk (approx. 30 to 45 mir roject: project report (ap	rcises: written examina didate each or oral exa nutes)			
Student Assessinents 2 To pass	ts must ment co and 3 s this m	omponents 1 through 3 t register for assessmer omponent 1 will be offe will be offered to be an odule, students must p	nt components 1 throus red once a year in the nounced.	gh 3 online (details t winter semester; det	ails on when asse	ssment compo-
Allocati	ion of p	Diaces				
Additio	nal info	ormation				
	- 4					
Worklo	au					
		FOKUS Physics (2010)		• generated 26-Aug-2024 • e		page 324 / 389

Teaching cycle

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

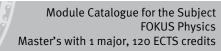
Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg ● generated 26-Aug-2024 ● exam. reg.	page 325 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation		
FOKUS Research Module Theoretical Elementary Particle Physics					11-FM-TEP-092-m01
Module	e coord	inator		Module offered by	
chairpe	erson o	f examination committee	_	Faculty of Physics a	and Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
12	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate	11-RQFT		
Conten	ts				
ry Parti rules, s	cle Phy tandar	sics. Principles of relativi d model of strong and ele	istic quantum field th	eory, perturbation th	st field of Theoretical Elementa- neory and application of Feynman rks.
Intende	ed lear	ning outcomes			
mentar ry Parti	y Partio cle Phy	le Physics. They know th	e mathematical meth structure of the stand	ods for the descript dard model based or	vork in the field of Theoretical Ele- ion of phenomena of Elementa- n symmetry principles and experi- oral presentation.
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
P (2 we Kompa Physics	ekly co ktsemi 5): S (2	ntact hours), German or nar Theoretische Elemen weekly contact hours), G	English, once a year (tarteilchenphysik (Bl erman or English, dei	(summer semester) ock Taught Seminar tails on availability t	: V (4 weekly contact hours) + Ü/ Theoretical Elementary Particle o be announced (block taught se- of the subsequent semester)
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
1. Topio tes) repo	cs cove or oral rt (appi		ises: written examina idate each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Details	ts mus on wh	omponents 1 and 2 will b t register for assessment en assessment compone nodule, students must pa	components 1 and 2 nt 2 will be offered to	online (details to be be announced.	
Allocat	ion of p	olaces			
Additional information					
Workload					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	ars in			
	Master's degree (1 major) FOKUS Physics (2010)				

Master's with 1 major FOKUS Physics (2010)





Master's degree (1 major) FOKUS Physics (2011)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 327 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation					
FOKUS Research Module Theoretical Elementary Particle Physics with Mini Re- search Project					
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)					
16 numerical grade					
Duration Module level Other prerequisites					
1 semester graduate 11-RQFT					
Contents					
Specific and advanced knowledge of independent scientific work in the specialist field of Theoretical Elementa- ry Particle Physics. Principles of relativistic quantum field theory, perturbation theory and application of Feynma rules, standard model of strong and electroweak interaction of leptons and quarks.					
Intended learning outcomes					
The students have special and advanced knowledge of independent scientific work in the field of Theoretical El mentary Particle Physics. They know the mathematical methods for the description of phenomena of Elementary Particle Physics and understand the structure of the standard model based on symmetry principles and experimental observations. They are able to summarise the acquired knowledge in an oral presentation. They are able to successfully implement the acquired methods in a mini research project and to write down the results in a report.					
Courses (type, number of weekly contact hours, language — if other than German)					
Theoretische Elementarteilchenphysik (Theoretical Elementary Particle Physics): V (4 weekly contact hours) + Ü/ P (2 weekly contact hours), German or English, once a year (summer semester) Kompaktseminar Theoretische Elementarteilchenphysik (Block Taught Seminar Theoretical Elementary Particle Physics): S (2 weekly contact hours), German or English, details on availability to be announced (block taught se- minar (3 days), usually held during semester break) Miniforschungsprojekt Theoretische Elementarteilchenphysik (Mini Research Project Theoretical Elementary Particle Physics): P (2 weekly contact hours), German or English, details on availability to be announced (either block taught during semester break or approx. 3 weeks part time)					
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)					
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 					
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Details on when assessment components 2 and 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.					
Allocation of places					
Additional information					
Workload					

Teaching cycle

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

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg ● generated 26-Aug-2024 ● exam. reg.	page 329 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS Research Module Biophysics - Laboratory and Measurement Technolo-			urement Technolo-	11-FM-LMB-092-mo	1	
gy						
Module	coord	inator		Module offered by		
chairpe	rson of	f examination committee	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
special	ist fielc	dvanced knowledge of i l of Biophysics - laborat ompetencies.				
Intende	ed learr	ning outcomes				
especia	ally in tl knowle	nave special and advand he field of Biophysics ar dge, to apply the acquir tation.	nd laboratory and mea	suring techniques, a	and are able to repro	oduce the ac-
Course	5 (type, n	umber of weekly contact hours,	language — if other than Ger	man)		
contact Kompal sureme (block t	hours) ktsemin nt Tech aught s	esstechnik in der Biophy) + Ü/P (1 weekly contac nar Biophysik - Labor- un nology): S (2 weekly co seminar (3 days), usuall sessment (type, scope, langu	t hour), German or Eng nd Messtechnik (Block ntact hours), German y held during semeste	glish, once a year (su < Taught Seminar Bio or English, details or er break)	ummer semester) ophysics - Laborator n availability to be a	y and Mea- nnounced
module is	creditab	le for bonus)				
1. Topic tes) c repor	s cove or oral e t (appr	as the following assess red in lectures and exer- examination of one cano rox. 8 pages) lk (approx. 30 to 45 min	cises: written examina lidate each or oral exa			
Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Assessment component 1 will be offered once a year in the summer semester; details on when assessment com- ponent 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.						
Allocation of places						
Additional information						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	irs in				
Master's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 33 data record Master (120 ECTS) FOKUS Physik - 2010 page 33				page 330 / 389		

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	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation		
FOKUS Research Module Biophysics - Biophysical Measurement Technology					11-FM-BMT-092-mo	1
in Medi	in Medical Science					
Module	coord	inator		Module offered by		
chairpe	rson o	f examination committe	ee	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
10	1	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Content						
cipline	of Biop	dvanced knowledge of hysics - biophysical m al competencies.				
Intende	ed learr	ning outcomes				
especia ce the a	ally in the second s	nave special and advar he field of Biophysics a d knowledge, to apply l presentation.	nd biophysical measu	ring techniques in m	edicine, and are abl	e to reprodu-
Courses	5 (type, n	umber of weekly contact hours	s, language — if other than Ger	man)		
weekly Kompal Biophys tails on Method module is This mo	contac ktsemin sical M availa l of ass creditab	che Messtechnik in der t hours) + Ü/P (1 weekl nar Biophysik - Biophys easurement Technolog bility to be announced sessment (type, scope, lang le for bonus) as the following assess	y contact hour), Germa sikalische Messtechnik y in Medical Science): (block taught seminar uage – if other than German, o sment components	n or English, once a in der Medizin (Bloc S (2 weekly contact H (3 days), usually hel examination offered – if no	year (winter semeste ck Taught Seminar B nours), German or Er d during semester b t every semester, informati	er) iophysics - nglish, de- reak) ion on whether
tes) c repor 2. Semi Assessi	or oral e t (appr nar: ta ment ce	red in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 min omponents 1 and 2 will	didate each or oral exa nutes) be offered in German	amination in groups	(approx. 30 minutes	
Assessi nent 2 v	ment co will be	t register for assessme omponent 1 will be offe offered to be announce odule, students must	red once a year in the ed.	winter semester; det	ails on when assess	
Allocati	ion of p	olaces				
 Additional information Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	irs in				
	Module appears in laster's with 1 major FOKUS Physics (2010) JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Master (120 ECTS) FOKUS Physik - 2010 page 332 / 38					page 332 / 389

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	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS Research Module Nano Optics 11-FM-NOP-092-mod					1	
Module coordinator				Module offered by		
chairpe	erson o	f examination committe	e	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				
Conten	ts					
		dvanced knowledge of d of Nano-Optics, repro				
Intende	ed leari	ning outcomes				
especia	ally in t	nave special and advan he field of nano-optics, to summarise a sub-are	and are able to reprod	uce the acquired kn	owledge, to apply th	
Course	S (type, n	umber of weekly contact hours	, language — if other than Ger	man)		
once a Kompa or Engli break)	year (s ktsemi ish, det	k (Nanoelectronics): V ummer semester) nar Nanoelektronik (Blo rails on availability to b	ock Taught Seminar Na e announced (block ta	noelectronics): S (2 v ught seminar (3 days	weekly contact hour s), usually held durir	s), German ng semester
		s essment (type, scope, lang le for bonus)	uage — if other than German, e	examination offered — if no	t every semester, informati	on on whether
1. Topic tes) c repor	cs cove or oral o rt (appi	as the following assess red in lectures and exe examination of one can 'ox. 8 pages) lk (approx. 30 to 45 mir	rcises: written examina didate each or oral exa			
Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Students must meet certain prerequisites to qualify for admission to assessment component 1. The lecturer will inform them about the respective details at the beginning of the course. Assessment component 1 will be offered once a year in the summer semester; details on when assessment com- ponent 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.						
Allocat	ion of p	olaces				
Additional information						
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Master's wi	th 1 majoi	FOKUS Physics (2010)		• generated 26-Aug-2024 • e aster (120 ECTS) FOKUS Phys		page 334 / 389

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 335 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation		
FOKUS Research Module Low Dimensional Structures				11-FM-NDS-092-m01	
Module coordinator				Module offered by	
chairpe	rson of	examination committee		Faculty of Physics a	nd Astronomy
ECTS		d of grading	Only after succ. com	pl. of module(s)	
8	1	ical grade			
Duratio		Module level	Other prerequisites		
1 semes		graduate			
Content					
		dvanced knowledge of in nmetry, lattice dynamics,		work in the field of	ow-dimensional structures. Cry-
Intende	d learn	ing outcomes			
The stund		nave special and advance	ed knowledge of inde	pendent scientific w	ork in the field of low-dimensio-
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
hour), G Kompal kly cont	German ktsemir tact hou	or English, once a year (nar Niederdimensionale :	details to be announ Strukturen (Block Tau	ced) Ight Seminar Low Dir	act hours) + Ü/P (1 weekly contact mensional Structures): S (2 wee- plock taught seminar (3 days),
Method	l of ass		ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repor	s cover or oral e t (appr		ises: written examina date each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Student Assessi compor	ts must ment co nent 2 v	omponents 1 and 2 will b register for assessment omponent 1 will be offere vill be offered to be anno odule, students must pa	components 1 and 2 ed once a year (detail: ounced.	online (details to be s to be announced);	details on when assessment
Allocati	ion of p	laces			· · · · ·
Additio	nal info	ormation			
Workload					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master's degree (1 major) FOKUS Physics (2010)					
	Master's degree (1 major) FOKUS Physics (2011)				

Module title				Abbreviation	
FOKUS Research Module Quantum Phenomena in electronic correlated Materi-					11-FM-QPM-092-m01
als					
Module coordinator Module offered I				Module offered by	
chairpe	rson of	f examination committee		Faculty of Physics a	and Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
special quisitio "strong	ist field on of so ly corre	l of quantum phenomena cial and methodological	in electronically corr competencies. Introc Metal-insulator trans	related materials, re luction to the excitin	search area, especially in the production of knowledge, ac- ng and current research area of t, heavy fermions, High-tempera-
Intende	ed learn	ning outcomes			
especia techniq	lly in t ues, a	he field of quantum pher	omena in electronica the acquired knowled	ally correlated mater dge, to apply the acc	vork in a current research area, ials, laboratory and measuring quired methods and to summari-
Course	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
terials): announ Kompal Phenon bility to	V (3 w iced) ktsemi nena in be ani	eekly contact hours) + Ü, nar Quantenphänomene Electronic Correlated Ma nounced (block taught se	/P (1 weekly contact h in elektronisch korrel aterials): S (2 weekly eminar (3 days), usua	nour), German or Eng lierten Materialien (E contact hours), Gern lly held during seme	
		E essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether
1. Topic tes) c repoi	s cove or oral e t (appr		ises: written examina date each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Assessi compor	Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Assessment component 1 will be offered once a year (details to be announced); details on when assessment component 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.				
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Master's wi	th 1 major	FOKUS Physics (2010)	JMU Würzburg	• generated 26-Aug-2024 • e	exam. reg. page 337 / 389

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 338 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title					Abbreviation
FOKUS Research Module Quantum Phenomena in electronic correlated Materi					11-FM-QPM-MF-092-m01
als with	n Mini F	Research Project			
Module	e coordi	inator		Module offered by	
chairpe	rson of	examination committee		Faculty of Physics a	nd Astronomy
ECTS		od of grading	Only after succ. com	pl. of module(s)	
14 numerical grade					
Duratio	n	Module level	Other prerequisites		
1 seme		graduate			
Conten					
special sition o thods to the exc	ist fielc f socia o new s iting ar	l of quantum phenomena l and methodological cor scientific questions in a n	a in electronically com npetencies. Applicati nini research project of "strongly correlated	related materials, re on of the acquired p (e.g. experiments, ca d electron systems":	search area, especially in the production of knowledge, acqui- professional knowledge and me- ase studies etc.). Introduction to Metal-insulator transitions, Kon-
		ning outcomes			
especia produce	ally in th e the ac ea in ar	he specialist field of quan cquired knowledge, to ap n oral presentation and to	ntum phenomena in e ply the acquired met	electronically correla hods, to summarise	ork in a current research area, ated materials, and are able to re- a sub-area of the current rese- lowledge and methods in a mini
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
terials): announ Kompal Phenon bility to Minifor: tum Phe	: V (3 w iced) ktsemin nena in be anr schung enome	eekly contact hours) + Ü, nar Quantenphänomene Electronic Correlated Ma nounced (block taught se sprojekt Quantenphänor	/P (1 weekly contact h in elektronisch korrel aterials): S (2 weekly eminar (3 days), usua nene in elektronisch d Materials): P (2 wee	nour), German or Eng lierten Materialien (E contact hours), Gern lly held during seme korrelierten Materia ekly contact hours),	lien (Mini Research Project Quan- German or English, details on
			ge — if other than German, e	examination offered — if no	t every semester, information on whether
·		le for bonus)	ant components		
1. Topic tes) c repor 2. Semi	 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 				
Studen Assessi compoi To pass	Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Assessment component 1 will be offered once a year (details to be announced); details on when assessment components 2 and 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.				
Allocat	ion of p	olaces			
Additio	nal info	ormation			

Master's with	1 major FOKUS	Physics (2010)	

Workload

Teaching cycle

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

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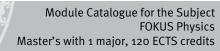
Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 340 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	title				Abbreviation
FOKUS Research Module Dirac Fermions in Mesoscopic System			tems	11-FM-RMS-092-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)	
9	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
special method	ist field lologica	d of Dirac fermions in me al competencies.			search area, especially in the edge, acquisition of social and
		ning outcomes			
especia	ally in t	he field of Dirac fermions	in mesoscopic syste	ms, and are able to	rork in a current research area, reproduce the acquired knowled- esearch area in an oral presenta-
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
contact Kompal soscop	hours) ktsemi ic Syste) + Ü/P (1 weekly contact nar Dirac Fermionen in M	hour), German or Eng esoskopischen Syste t hours), German or E	¦lish men (Block Taught S nglish, details on av	oscopic Systems): V (3 weekly Seminar Dirac Fermions in Me- railability to be announced (block
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repor	s cove or oral e t (appr		ises: written examina idate each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Details	ts mus [.] on whe	omponents 1 and 2 will b t register for assessment en assessment compone iodule, students must pa	components 1 and 2 nt 2 will be offered to	online (details to be be announced.	
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	irs in			
		ee (1 major) FOKUS Physi	cs (2010)		

Master's with 1 major FOKUS Physics (2010)





Master's degree (1 major) FOKUS Physics (2011)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 342 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation						
FOKUS	Resear	rch Module Nanoelectr	onics		11-FM-NEL-092-m01	L
Module	coord	inator		Module offered by		
chairpe	erson of	f examination committ	ee	Faculty of Physics and Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Specific and advanced knowledge for independent scientific work in the field of nanoelectronics. Transport phe- nomena that cannot be observed in classical electronic switches appear in highly miniaturised electronic compo- nents. The research module provides insights into production techniques, characteristics and application fields of modern nanoelectronic components, which function on the basis of ballistic and coherent transport.						
Intende	ed learr	ning outcomes				
nano-el know fu	lectron unction	ics. They have mastere s and applications of r	nced knowledge of inde d the basics of electror espective components o summarise a field of	nics of nanostructure and are able to repre	s in theory and prac oduce the acquired k	tice. They knowledge,
Course	S (type, n	umber of weekly contact hour	s, language — if other than Ger	rman)		
year (su Kompal weekly	ummer ktsemi contac	semester) nar Nano-Optik und Sp	ly contact hours) + Ü/P ektroskopie (Block Tau glish, details on availa break)	ght Seminar Nano-O	ptics and Spectrosco	opy): S (2
		e essment (type, scope, lang le for bonus)	guage — if other than German, o	examination offered — if no	t every semester, informati	on on whether
1. Topic tes) c repoi	cs cove or oral e rt (appr		rcises: written examina ndidate each or oral exa			
Studen Assess ponent	ts mus ment co 2 will b	t register for assessme omponent 1 will be offe pe offered to be annou	l be offered in German nt components 1 and 2 ered once a year in the nced. pass both assessment	online (details to be summer semester; d	etails on when asse	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teachir	Teaching cycle					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Master's wi	th 1 major	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 343 / 389

Module appears in

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

F		
Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 344 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS	Resea	rch Module Complex S	ystems with Mini Rese	arch Project	11-FM-PKS-MF-092-1	m01
Module	e coord	inator		Module offered by		
chairperson of examination committee		ee	Faculty of Physics a	and Astronomy		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
12	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester graduate						
Conten	nts					
special petenc researc ar dyna mena:	list field ies. Ap ch proje amics: I Scaling	d of Complex Systems, plication of the acquire ect (e.g. experiments, c Deterministic chaos, sy	r independent scientifi reproduction of knowle ed professional knowle ase studies etc.) Stat nchronisation, chaotic ations, Monte Carlo sim	edge, acquisition of s dge and methods to sistical mechanics an lasers. Encoding, ch	social and methodole new scientific questind information theory aotic networks Crit	ogical com- ions in a mini y Non-line- tical pheno-
Intend	ed lear	ning outcomes				
comple which a knowle	ex syste are use edge of	ems. They know and are d to describe physics o a specialist field and p	nced knowledge of inde e able to apply the met of complex systems, to rove their knowledge in e and methods in a min	hods of Statistical Ph current questions. Th n a seminar presenta	nysics and non-lineat hey have acquired ac	r dynamics, dvanced
Course	S (type, 1	number of weekly contact hour	s, language — if other than Ge	rman)		
hours), Kompa man or mester Minifor	, Germa Iktsemi Englis break) rschung n or Eng	an or English, once a ye nar Komplexe Systeme h, details on availabilit gsprojekt Komplexe Sys glish, details on availal	of Complex Systems): \ ar (winter semester) (Block Taught Semina y to be announced (blo steme (Mini Research P pility to be announced	r Complex Systems): ock taught seminar (Project Complex System	S (2 weekly contact 3 days), usually held ems): P (2 weekly con	hours), Ger- during se- ntact hours),
Metho	d of as	Sessment (type, scope, lang	guage — if other than German,	examination offered — if no	ot every semester, informati	on on whether
module is	s creditat	le for bonus)				
1. Topi tes) repo 2. Sem	 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 3. Research project: project report (approx. 8 pages) 					
Assessment components 1 through 3 will be offered in German or English. Students must register for assessment components 1 through 3 online (details to be announced). Assessment component 1 will be offered once a year in the winter semester; details on when assessment compo- nents 2 and 3 will be offered to be announced. To pass this module, students must pass each of the assessment components 1 through 3.						
Allocat	tion of	olaces				
Additio	onal inf	ormation				
Master's w	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e Master (120 ECTS) FOKUS Phys	-	page 345 / 389

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 with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 346 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation		
FOKUS	Resear	rch Module Complex S	ystems		11-FM-PKS-092-mo	L
Module	coord	inator		Module offered by		
chairpe	erson of	f examination committ	ee	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
- Statist chaotic	Specific and advanced knowledge for independent scientific work in the field of physics of complex systems. - Statistical mechanics and information theory Non-linear dynamics: Deterministic chaos, synchronisation, chaotic lasers. Encoding, chaotic networks Critical phenomena: Scaling law, phase transformations, Monte Carlo simulation. Random walk, stochastic processes beyond the thermal equilibrium.					nisation,
Intende	ed learr	ning outcomes				
comple which a	x syste are use	ms. They know and are d to describe physics o	nced knowledge of inde a able to apply the meth of complex systems, to rove their knowledge in	hods of Statistical Ph current questions. Th	nysics and non-linea ney have acquired ac	r dynamics,
Course	S (type, n	umber of weekly contact hour	s, language — if other than Ger	man)		
hours), Kompa	Germa ktsemi Englisł	n or English, once a ye nar Komplexe Systeme	of Complex Systems): V ar (winter semester) (Block Taught Seminar y to be announced (blo	Complex Systems):	S (2 weekly contact	hours), Ger-
		s essment (type, scope, lang le for bonus)	uage — if other than German, e	examination offered — if no	t every semester, informati	on on whether
1. Topic tes) c repor	cs cove or oral e rt (appr		rcises: written examina ndidate each or oral exa			
Studen Assessi sessme	Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Assessment component 1 will be offered in the winter semester (details to be announced); details on when as- sessment component 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.					
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Workload						
Teachir	ng cycl	9				
Referre	d to in	LPOI (examination regulati	ons for teaching-degree progra	mmes)		
Master's wi	th 1 major	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 347 / 389

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 348 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	í I

Module title			Abbreviation		
FOKUS Research Module Applied Semiconductor Physics and Devices		11-FM-SPD-102-m01			
Module coordinator Module offere					
chairperson of examination comm	ittee	Faculty of Physics a	and Astronomy		
ECTS Method of grading	Only after succ. cor	npl. of module(s)			
10 numerical grade					
Duration Module level	Other prerequisites	5			
1 semester graduate	11-KM-2				
Contents					
Specific and advanced knowledge specialist field of Semiconductor F methodological competencies. Pri tors. Components from the areas c	Physics and Components nciples of Semiconducto	, reproduction of kno r Physics. Introductic	wledge, acquisition of social and		
Intended learning outcomes					
The students have special and adv Physics. They are familiar with the and phononic band structures of in perties. They know the realisation conductors and their technologica are able to summarise their knowl	properties of semicondu mportant semiconductor possibilities of low-dime l importance. They have	ctors, they have gain s and the resulting el nsional charge carrie acquired advanced k	eed an overview of the electronic lectronic, optical and thermal pro- er systems on the basis of semi-		
Courses (type, number of weekly contact h	ours, language — if other than Ge	rman)			
Halbleiterphysik und Bauelemente (Applied Semiconductor Physics and Devices): V (3 weekly contact hours) + Ü/P (1 weekly contact hour), German or English, once a year (winter semester) Kompaktseminar Halbleiterphysik und Bauelemente (Block Taught Seminar Applied Semiconductor Physics and Devices): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break)					
Method of assessment (type, scope, l	anguage — if other than German,	examination offered — if no	ot every semester, information on whether		
module is creditable for bonus)					
 This module has the following ass 1. Topics covered in lectures and e tes) or oral examination of one o report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 pages) 	exercises: written examin candidate each or oral ex				
Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Assessment component 1 will be offered once a year in the winter semester; details on when assessment compo- nent 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.					
Allocation of places					
Additional information	Additional information				
Workload					
Teaching cycle					

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 350 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	title				Abbreviation
FOKUS Research Module Quantum Transport in Semiconductor Nanostructu-			11-FM-QTH-102-m01		
res					
Module	coord	inator		Module offered by	
chairpe	rson of	examination committee		Faculty of Physics a	nd Astronomy
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
phenon compor	nena th nents. T	hat cannot be observed ir The research module prov	n classical electronic vides insights into pr	switches appear in h oduction techniques	quantum transport. Transport nighly miniaturised electronic s, characteristics and application llistic and coherent transport.
Intende	ed learr	ning outcomes			
of quan They kn	The students have special and advanced knowledge of independent scientific work in the current research area of quantum transport. They have mastered the basics of electronics of nanostructures in theory and practice. They know functions and applications of respective components and are able to reproduce the acquired knowledge, to apply the acquired methods and to summarise a field of the current research area in an oral presentation.				
Course	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
Quantentransport in Halbleiter-Nanostrukturen (Quantum Transport in Semiconductor Nanostructures): V (3 wee- kly contact hours) + Ü/P (1 weekly contact hour), German or English, once a year (summer semester) Kompaktseminar Quantentransport in Halbleiternanostrukturen (Block Taught Seminar Quantum Transport in Semiconductor Nanostructures): S (2 weekly contact hours), German or English, details on availability to be an- nounced (block taught seminar (3 days), usually held during semester break)					
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)					
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 					
Studen Assessi ponent	Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Assessment component 1 will be offered once a year in the summer semester; details on when assessment com- ponent 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.				
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Workload					
Teachir	ng cyclo	9			

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 352 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
FOKUS Research Module Methods in Surface Spectroscopy 11-FM-MSS-102-m01			1			
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	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 seme	ster	graduate	11-TQM, 11-KM2 , 11-	FK2 (or 11-T3, 11-E5,	11-E7)	
Conten	ts					
		determination of the el		lids and surfaces: Ba	and dispersion and l	oand gaps,
Intende	ed learı	ning outcomes				
conduc	t, evalı	know the physical prind uate and interpret simp able to summarise thei	le measurements. They	y have acquired adva		
Course	S (type, n	umber of weekly contact hour	s, language — if other than Ger	man)		
Котра	ktsemi Englisl	Irface Spectroscopy: V nar (Block Taught Semi n, details on availabilit	nar) Applications of Su	irface Spectroscopy:	S (2 weekly contact	hours), Ger-
		s essment (type, scope, lang le for bonus)	uage — if other than German, o	examination offered — if no	t every semester, informati	on on whether
1. Topic tes) o repo 2. Semi Assess Studen Assess nent 2	cs cove or oral o rt (appi inar: ta ment co ts mus ment co will be	as the following assess red in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 min omponents 1 and 2 will t register for assessme omponent 1 will be offe offered to be announce nodule, students must	rcises: written examina didate each or oral exa nutes) be offered in German nt components 1 and 2 red once a year in the ed.	amination in groups or English. online (details to be winter semester; det	(approx. 30 minutes) announced). ails on when assess) or project ment compo-
Allocat						
Additio	nal inf	ormation				
Auditio						
Worklo	ad					
Teachi	ng cycl	٩				
		•				
Referre	d to in	LPO I (examination regulation		mmec)		
				inites)		
Module	annea	ors in				
Master Master	's degro	ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy ee (1 major) FOKUS Phy	sics (2011)			
Master's wi	ith 1 major	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 353 / 389

Module	title				Abbreviation
FOKUS	Resear	rch Module Methods in S	urface Spectroscopy	with Mini Research	11-FM-MSS-MF-102-m01
Project					
Module	coord	inator		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)	
12	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate	11-TQM, 11-KM2 , 11-	FK2 (or 11-T3, 11-E5,	11-E7)
Conten	ts				
		determination of the elec , electronic correlations	tronic structure of so	lids and surfaces: Ba	and dispersion and band gaps,
Intende	ed learı	ning outcomes			
Matter" (photo	, they l emissi	have acquired basic know	vledge for the applica spectroscopy with sy	ation of modern metl nchrotron radiation e	n different areas of "Condensed hods of surface spectroscopy etc.) and are able to interpret and
Course	5 (type, n	number of weekly contact hours, la	anguage — if other than Ger	man)	
Kosmol Kompal man or mester	ogie (C ktsemi Englisl break) schung	Cosmology): V (3 weekly c nar (Block Taught Semina h, details on availability t	ontact hours) + Ü/P (ar) Applications of Su o be announced (blo	1 weekly contact ho rface Spectroscopy: ck taught seminar (3	once a year (winter semester) ur), German or English S (2 weekly contact hours), Ger- days), usually held during se- Spectroscopy): P (2 weekly con-
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repor 2. Semi	s cove or oral t (appi nar: ta		ises: written examina idate each or oral exa tes)		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Assessi nents 2 To pass	ts mus ment co and 3 this m	will be offered to be anno nodule, students must pa	components 1 throug d once a year in the v ounced.	gh 3 online (details t winter semester; det	ails on when assessment compo-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			

Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 355 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	1

Module title			Abbreviation			
FOKUS Research Module High Energy Astrophysics			11-FM-HAS-111-m01			
Module coordinator Module offer			Module offered by	ered by		
chairpe	erson o	f examination committe	ee	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate	11-A4, 11-KET			
Conten	ts					
Specifi sics.	c and a	dvanced knowledge fo	r independent scientifi	c work in the researc	h area of High-Ener§	gy Astrophy-
Intende	ed lear	ning outcomes				
Astroph	nysics.	They have knowledge of	nced knowledge of inde of cosmology and/or Pl narise the acquired kno	asma Astrophysics (cf. modules 11-AKM,	
Course	S (type, r	umber of weekly contact hour	s, language — if other than Gei	rman)		
English Kosmo Kompa hours),	, once logie (C ktsemi Germa	a year (summer semes osmology): V (3 weekl nar Hochenergie-Astro	nysics): V (3 weekly con ter) y contact hours) + Ü/P ohysik (Block Taught Se n availability to be anno	(1 weekly contact ho eminar High Energy A	ur), German or Englis Astrophysics): S (2 w	sh eekly contact
		s essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
1. Topic tes) c repo	cs cove or oral rt (appi		rcises: written examina ndidate each or oral exa			
Studen Details Lecture with the	ts mus on whe s and e e lectur	t register for assessme en assessment compor exercises will cover eith rer).	l be offered in German nt components 1 and 2 nent 2 will be offered to ner plasma-astrophysic pass both assessment	online (details to be be announced. s or cosmology (as a	nnounced by or agre	
Allocat						
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	٩				
	3 .,	-				
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	mmes)		
				,		
Module	annea	urs in				
mouul						
Master's wi	ith 1 majo	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 356 / 389

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Module	e title				Abbreviation	
FOKUS	Resea	rch Module High Energ	y Astrophysics with Mi	ni Research Project	11-FM-HAS-MF-111-r	n01
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committ	ee	Faculty of Physics a	ind Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
16	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate	11-A4, 11-KET			
Conten	ts					
Specifi sics.	c and a	dvanced knowledge fo	r independent scientifi	c work in the researc	ch area of High-Eners্	ʒy Astrophy-
Intende	ed lear	ning outcomes				
Astroph	hysics. e to ap	They are able to reproc ply the acquired metho	nced knowledge of inde duce and summarise th ods, to conduct and eva	e acquired knowledg	ge in an oral present	ation. They
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
English Kosmo Kompa hours), during Astroph Methoo module is This mo 1. Topic tes) o repo	h, once logie (C ktsemi Germa semest hysikal d of ass creditab odule h cs cove or oral rt (app	a year (summer semes Cosmology): V (3 weekl nar Hochenergie-Astro in or English, details of ter break) isches Praktikum (Prac sessment (type, scope, lang le for bonus) as the following asses red in lectures and exe	y contact hours) + Ü/P physik (Block Taught So n availability to be anno tical Course Astrophysi guage — if other than German, sment components ercises: written examina adidate each or oral exa	(1 weekly contact ho eminar High Energy A bunced (block taught cs): P (4 weekly cont examination offered — if no ation (approx. 90 min	ur), German or Englis Astrophysics): S (2 w t seminar (3 days), u tact hours) ot every semester, information nutes) or talk (appro-	sh veekly contact isually held ion on whether x. 30 minu-
3. Lab o cess they sults	course fully co did no of the	(research project): a) P mpleted if a Testat (ex t pass. Or b) discussion experiment (approx. 2	reparing, performing ar am) is passed. Student n to test the students' u	s will be given one o inderstanding of the	pportunity to repeat	experiments
Details	on wh es and e	en assessment compo exercises will cover eitl	nt components 1 throug nent 2 will be offered to ner plasma-astrophysic	be announced.		eed upon
1	To pass this module, students must pass both assessment component 1 and assessment component 2.					
Allocat	ion of _l	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Master's wi	ith 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • 6 laster (120 ECTS) FOKUS Phys	-	page 358 / 389

Teaching cycle

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

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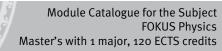
Module appears in

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 359 / 389
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Module title					Abbreviation	
FOKUS Research Module Spectroscopy and Nano-Optics					11-FM-NOS-F-111-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)				
10	10 numerical grade					
Duration		Module level	Other prerequisites			
1 semester		graduate	11-KM, 11-TQM			
Contents						
Specific and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Nano-Optics, reproduction of knowledge, acquisition of social and methodological competencies.						
Intended learning outcomes						
The students have special and advanced knowledge of independent scientific work in a current research area, especially in the field of nano-optics, and are able to reproduce the acquired knowledge, to apply the acquired methods and to summarise a sub-area of the current research area in an oral presentation.						
Courses (type, number of weekly contact hours, language — if other than German)						
Festkörper-Spektroskopie (Solid State Spectroscopy): V (3 weekly contact hours) + Ü/P (1 weekly contact hour), German or English, once a year (summer semester) Kompaktseminar Nano-Optik und Spektroskopie (Block Taught Seminar Nano-Optics and Spectroscopy): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break)						
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether						
module is creditable for bonus)						
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 						
Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Assessment component 1 will be offered once a year in the summer semester; details on when assessment com- ponent 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.						
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) FOKUS Physics (2010)						

Master's with 1 major FOKUS Physics (2010)





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

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Module title			Abbreviation			
FOKUS Research Module Nano-Optics and Spectroscopy 11-FM-NOS-N-111-m01			01			
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	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	i		
1 seme	ster	graduate				
Conten	ts					
Specific and advanced knowledge of independent scientific work in a current research area, especially in the specialist field of Nano-Optics and Spectroscopy, reproduction of knowledge, acquisition of social and methodological competencies.						
Intende	ed lear	ning outcomes				
especia apply t	ally in t he acqu	have special and advan he field of nano-optics uired methods and to s	and spectroscopy, and ummarise a sub-area c	are able to reproduce of the current researc	ce the acquired know	wledge, to
		number of weekly contact hours				tala ana a
year (sı Kompa	ummer ktsemi	lano-Optics): V (2 week semester) nar Nano-Optik (Block ⁻ n availability to be anno	aught Seminar Nano-	Optics): S (2 weekly o	contact hours), Germ	an or Eng-
Method	d of ass	sessment (type, scope, lang le for bonus)				
1. Topic tes) c repo	cs cove or oral rt (appi	as the following assess red in lectures and exe examination of one can rox. 8 pages) lk (approx. 30 to 45 mir	rcises: written examina didate each or oral exa			-
Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Students must meet certain prerequisites to qualify for admission to assessment component 1. The lecturer will inform them about the respective details at the beginning of the course. Assessment component 1 will be offered once a year in the summer semester; details on when assessment com- ponent 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.						
Allocat				· · ·		
Additio	nal inf	ormation				
Workload						
Toachir						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	irs in				
Master's wi	ith 1 majo	r FOKUS Physics (2010)		• generated 26-Aug-2024 • e Naster (120 ECTS) FOKUS Phys		page 362 / 389

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Module title A			Abbreviation		
FOKUS	FOKUS Research Module 11-FM4-112-m01				
Module coordinator		Module offered by			
chairpe	rson of	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			
Conten	ts				
Specifi	c and a	dvanced knowledge of ir	dependent scientific	work in a current re-	search area.
Intende	ed learr	ning outcomes			
They ha	ave mas	stered the basics in theo	ry and practice. They	are able to reproduc	york in a current research area. The the acquired knowledge, to ap- the in an oral presentation.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
contact FOKUS	: hours) Kompa) + Ü/P (1 weekly contact	hour), German or Eng	glish, details on avai	Current Research): V (2 weekly lability to be announced urs), German or English, details
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repoi	cs cove or oral e rt (appr		ises: written examina date each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Details	ts musi on whe	omponents 1 and 2 will b t register for assessment en assessment compone odule, students must pa	components 1 and 2 nts will be offered to	online (details to be be announced.	
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cycle	e			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	irs in			
Master'	Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2006)				
mastel	Jucgit				

Module title Abbreviation			Abbreviation		
FOKUS Research Module			11-FM6-112-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)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Specifi	c and a	dvanced knowledge of in	dependent scientific	work in a current re	search area.
Intende	ed learn	ning outcomes			
They ha	ave mas	stered the basics in theor	ry and practice. They	are able to reproduc	ork in a current research area. e the acquired knowledge, to ap- a in an oral presentation.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
contact FOKUS	: hours) Kompa	+ Ü/P (1 weekly contact	hour), German or Eng	lish, details on avai	Current Research): V (3 weekly lability to be announced urs), German or English, details
		e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repoi 2. Semi	cs cove or oral o rt (appr nar: ta	examination of one cand rox. 8 pages) lk (approx. 30 to 45 minu	ises: written examina date each or oral exa tes)	mination in groups	nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Details	ts mus [.] on whe	omponents 1 and 2 will b t register for assessment en assessment compone odule, students must pa	components 1 and 2 nts will be offered to	online (details to be be announced.	
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	irs in			
Master'	s degre	ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi ee (1 major) FOKUS Physi	cs (2011)		

FOKUS Research Module Module coordinator chairperson of examination committee	only after succ. com	Madula offered by	11-FM8-112-m01	
		Madula offered by		
chairperson of examination committee		Module offered by		
	Only after succ. com	Faculty of Physics a	nd Astronomy	
ECTS Method of grading	1	pl. of module(s)		
12 numerical grade				
Duration Module level	Other prerequisites			
1 semester graduate				
Contents				
Specific and advanced knowledge of in	ndependent scientific	work in a current re	search area.	
Intended learning outcomes				
The students have special and advanc They have mastered the basics in theo ply the acquired methods and to summ	ry and practice. They	are able to reproduc	e the acquired knowledge, to ap-	
Courses (type, number of weekly contact hours,	language — if other than Ger	man)		
FOKUS Vorlesung zu aktuellen Forschu contact hours) + Ü/P (2 weekly contact FOKUS Kompaktseminar (FOKUS Block on availability to be announced	t hours), German or Er	nglish, details on ava	ailability to be announced	
Method of assessment (type, scope, langua module is creditable for bonus)	age — if other than German, e	examination offered — if no	t every semester, information on whether	
 This module has the following assess 1. Topics covered in lectures and exercises) or oral examination of one cand report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 	ises: written examina idate each or oral exa			
Assessment components 1 and 2 will b Students must register for assessment Details on when assessment compone To pass this module, students must pa	components 1 and 2 ents will be offered to	online (details to be be announced.		
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) FOKUS Physi Master's degree (1 major) FOKUS Physi Master's degree (1 major) FOKUS Physi	ics (2011)			

Module title Abbreviation						
FOKUS	Resear	ch Module with Mini R	esearch Project		11-FM4-MF-112-m01	
Module	e coord	inator		Module offered by		
chairpe	erson of	examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
12	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Specifi	c and a	dvanced knowledge of	independent scientific	work in a current re	search area.	
Intended learning outcomes						
They ha ply the are abl in a rep	ave mas acquire e to suc port.	nave special and advan stered the basics in the ed methods and to sum ccessfully implement th	ory and practice. They marise a topic of the s e acquired methods ir	are able to reproduc elected research are a mini research pro	e the acquired know a in an oral presenta	/ledge, to ap- ation. They
Course	S (type, n	umber of weekly contact hours	, language — if other than Ge	man)		
contact FOKUS on avai FOKUS	FOKUS Vorlesung zu aktuellen Forschungsthemen (FOKUS Lecture on Topics in Current Research): V (2 weekly contact hours) + Ü/P (1 weekly contact hour), German or English, details on availability to be announced FOKUS Kompaktseminar (FOKUS Block Taught Seminar): S (2 weekly contact hours), German or English, details on availability to be announced FOKUS Miniforschungsprojekt (FOKUS Mini Research Project): P (2 weekly contact hours), German or English, de- tails on availability to be announced				nced ish, details	
		essment (type, scope, langu le for bonus)	lage — if other than German,	examination offered — if no	t every semester, informati	on on whether
1. Topio tes) repo 2. Sem	cs cove or oral e rt (appr inar: ta	as the following assess red in lectures and exer examination of one can ox. 8 pages) lk (approx. 30 to 45 min oject: project report (ap	cises: written examina didate each or oral exa utes)			
Studen Details	its mus [.] on whe	omponents 1 and 3 will t register for assessmer en assessment compon odule, students must p	t components 1 and 3 ents will be offered to	online (details to be be announced.		
Allocat	ion of p	olaces				
Additio	onal info	ormation				
Worklo	ad					
Teachi	ng cycl	9				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master's w	ith 1 major	FOKUS Physics (2010)		• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys		page 367 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 368 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation						
FOKUS	Resear	ch Module with Mini R	esearch Project		11-FM6-MF-112-m01	
Module	e coordi	nator		Module offered by		
chairpe	erson of	examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
14	numer	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Specifi	c and a	dvanced knowledge of	independent scientific	work in a current re	search area.	
Intende	Intended learning outcomes					
They ha ply the are able in a rep	ave mas acquire e to suc port.	nave special and advan stered the basics in the ed methods and to sum ccessfully implement th	ory and practice. They marise a topic of the s e acquired methods ir	are able to reproduc elected research are a mini research pro	e the acquired know a in an oral presenta	/ledge, to ap- ation. They
		umber of weekly contact hours				
contact FOKUS on avai FOKUS	t hours) Kompa lability Minifor	ang zu aktuellen Forsch + Ü/P (1 weekly contac ktseminar (FOKUS Bloc to be announced schungsprojekt (FOKUS bility to be announced	t hour), German or Eng k Taught Seminar): S (glish, details on avai 2 weekly contact hou	lability to be annour urs), German or Engl	nced ish, details
Method	d of ass	essment (type, scope, lang	lage — if other than German,	examination offered — if no	t every semester, informati	on on whether
module is	creditab	le for bonus)				
1. Topio tes) o repo 2. Semi	cs cove or oral e rt (appr inar: tal	as the following assess red in lectures and exe examination of one can ox. 8 pages) lk (approx. 30 to 45 mir oject: project report (ap	cises: written examina didate each or oral exa utes)			
Studen Details	ts musi on whe	omponents 1 and 3 will t register for assessmer en assessment compon odule, students must p	nt components 1 and 3 ents will be offered to	online (details to be be announced.		
Allocat	ion of p	laces				
Additio	nal info	ormation				
Worklo	ad					
Teachi	ng cycle	9				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	rs in				
Mactoria	th a main	FOKUS Physics (2010)	16011160	• concreted of Aug concerns		page 260 / 201
master S WI	an i major	TORUS F HYSICS (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 369 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 370 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation						
FOKUS	Resear	ch Module with Mini R	esearch Project		11-FM8-MF-112-m01	
Module	e coord	inator		Module offered by		
chairpe	erson of	f examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
16	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Specifi	c and a	dvanced knowledge of	independent scientific	work in a current re	search area.	
Intended learning outcomes						
They ha ply the are abl in a rep	ave mas acquire e to suc port.	nave special and advan stered the basics in the ed methods and to sum ccessfully implement th	ory and practice. They marise a topic of the s e acquired methods ir	are able to reproduc elected research are a mini research pro	e the acquired know a in an oral presenta	ledge, to ap- ation. They
		umber of weekly contact hours				
contact FOKUS on avai FOKUS	t hours) Kompa ilability Minifor	ung zu aktuellen Forsch + Ü/P (2 weekly contac ktseminar (FOKUS Bloc to be announced rschungsprojekt (FOKUS bility to be announced	et hours), German or E k Taught Seminar): S (nglish, details on ava 2 weekly contact hou	ailability to be annou urs), German or Engli	inced ish, details
		e essment (type, scope, langu le for bonus)	age — if other than German,	examination offered — if no	t every semester, informati	on on whether
1. Topio tes) repo 2. Sem	cs cove or oral e rt (appr inar: ta	as the following assess red in lectures and exer examination of one can rox. 8 pages) lk (approx. 30 to 45 mir oject: project report (ap	cises: written examina didate each or oral exa utes)			
Studen Details	ts mus on whe	omponents 1 and 3 will t register for assessmer en assessment compon odule, students must p	it components 1 and 3 ents will be offered to	online (details to be be announced.		
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in					
Master's w	ith 1 major	FOKUS Physics (2010)		• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys		page 371 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 372 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title				Abbreviation	
FOKUS Res	FOKUS Research Module 11-FM4A-112-m01				
Module co	ordinator		Module offered by		
chairperso	n of examination committee		Faculty of Physics a	nd Astronomy	
ECTS Me	thod of grading	Only after succ. com	pl. of module(s)		
8 nui	merical grade				
Duration	Module level	Other prerequisites			
1 semester	graduate				
Contents					
Specific an	d advanced knowledge of ir	dependent scientific	work in a current re-	search area.	
Intended le	earning outcomes				
They have i		ry and practice. They	are able to reproduc	ork in a current research area. e the acquired knowledge, to ap- a in an oral presentation.	
Courses (typ	be, number of weekly contact hours, l	anguage — if other than Ger	man)		
contact hou FOKUS Kom	urs) + Ü/P (1 weekly contact	hour), German or Eng	glish, details on avai	Current Research): V (2 weekly lability to be announced urs), German or English, details	
	assessment (type, scope, langua itable for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
1. Topics co tes) or or report (a		ises: written examina idate each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project	
Students m Details on v	nt components 1 and 2 will b nust register for assessment when assessment compone s module, students must pa	components 1 and 2 nts will be offered to	online (details to be be announced.		
Allocation	of places				
Additional	information				
Workload					
Teaching c	ycle				
Referred to	in LPO I (examination regulation	s for teaching-degree progra	mmes)		
Module ap	Module appears in				
Master's de	egree (1 major) FOKUS Physi egree (1 major) FOKUS Physi egree (1 major) FOKUS Physi	cs (2011)			

Module title			Abbreviation		
FOKUS Research Module					11-FM6A-112-m01
Module	coord	inator		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)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Specifi	c and a	dvanced knowledge of in	dependent scientific	work in a current re	search area.
Intende	ed learr	ning outcomes			
They ha	ave mas	stered the basics in theor	ry and practice. They	are able to reproduc	ork in a current research area. e the acquired knowledge, to ap- a in an oral presentation.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
contact FOKUS	: hours) Kompa	+ Ü/P (1 weekly contact	hour), German or Eng	lish, details on avai	Current Research): V (3 weekly lability to be announced urs), German or English, details
		e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repoi 2. Semi	cs cove or oral o rt (appr nar: ta	examination of one cand rox. 8 pages) lk (approx. 30 to 45 minu	ises: written examina idate each or oral exa tes)	mination in groups	nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Details	ts mus [.] on whe	omponents 1 and 2 will b t register for assessment en assessment compone odule, students must pa	components 1 and 2 nts will be offered to	online (details to be be announced.	
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cycl	9			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	Module appears in				
Master'	Maater'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		
FOKUS Research Module					11-FM8A-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)	
12	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Specifi	c and a	dvanced knowledge of ir	dependent scientific	work in a current re	search area.
Intende	ed leari	ning outcomes			
They ha	ave ma	stered the basics in theo	ry and practice. They	are able to reproduc	ork in a current research area. e the acquired knowledge, to ap- a in an oral presentation.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
contact FOKUS	t hours) Kompa) + Ü/P (2 weekly contact	hours), German or Er	nglish, details on ava	Current Research): V (4 weekly ailability to be announced urs), German or English, details
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
1. Topic tes) c repor	cs cove or oral (rt (appi		ises: written examina idate each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project
Studen Details	ts mus on whe	omponents 1 and 2 will b t register for assessment en assessment compone odule, students must pa	components 1 and 2 nts will be offered to	online (details to be be announced.	
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	Teaching cycle				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)				
Module	e appea	in			
Master'	Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2011) Master's degree (1 major) FOKUS Physics (2006)				
	<u> </u>	. , , , , , , , , , , , , , , , , , , ,			

Module	title				Abbreviation	
FOKUS	Mini Ro	esearch Project			11-FM4A-MF-112-mo)1
Module	coordi	nator		Module offered by		
chairpe	rson of	examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	d of grading	Only after succ. con	npl. of module(s)		
12	numer	ical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Content	s					
Specific	and a	dvanced knowledge of	independent scientific	work in a current re	search area.	
Intende	d learr	ing outcomes				
They ha ply the a are able in a repo	The students have special and advanced knowledge of independent scientific work in a current research area. They have mastered the basics in theory and practice. They are able to reproduce the acquired knowledge, to ap- ply the acquired methods and to summarise a topic of the selected research area in an oral presentation. They are able to successfully implement the acquired methods in a mini research project and to write down the results in a report.					
		umber of weekly contact hours				
contact FOKUS I on avail FOKUS I	FOKUS Vorlesung zu aktuellen Forschungsthemen (FOKUS Lecture on Topics in Current Research): V (2 weekly contact hours) + Ü/P (1 weekly contact hour), German or English, details on availability to be announced FOKUS Kompaktseminar (FOKUS Block Taught Seminar): S (2 weekly contact hours), German or English, details on availability to be announced FOKUS Miniforschungsprojekt (FOKUS Mini Research Project): P (2 weekly contact hours), German or English, details on availability to be announced				nced ish, details	
Method	of ass	essment (type, scope, lang	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
module is	creditab	e for bonus)				
1. Topic tes) o repor 2. Semin	s cove or oral e t (appr nar: tal	as the following assess red in lectures and exe examination of one can ox. 8 pages) k (approx. 30 to 45 mir oject: project report (aj	rcises: written examina didate each or oral exa nutes)			
Student Details	s must on whe	omponents 1 and 3 will register for assessme en assessment compor odule, students must p	nt components 1 and 3 ents will be offered to	online (details to be be announced.		
Allocati	on of p	laces				
Additio	nal info	ormation				
Workloa	ad					
Teachin	g cycle	9				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	rs in				
	h					
waster's wit	n 1 major	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 376 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 377 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module	e title				Abbreviation	
FOKUS	FOKUS Research Module with Mini Research Project			11-FM6A-MF-112-mc)1	
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
14	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Specifi	c and a	dvanced knowledge of	independent scientific	work in a current re	search area.	
Intende	ed learı	ning outcomes				
They ha ply the are abl in a rep	The students have special and advanced knowledge of independent scientific work in a current research area. They have mastered the basics in theory and practice. They are able to reproduce the acquired knowledge, to apply the acquired methods and to summarise a topic of the selected research area in an oral presentation. They are able to successfully implement the acquired methods in a mini research project and to write down the results in a report.					
FOKUS Vorlesung zu aktuellen Forschungsthemen (FOKUS Lecture on Topics in Current Research): V (3 weekly contact hours) + Ü/P (1 weekly contact hour), German or English, details on availability to be announced FOKUS Kompaktseminar (FOKUS Block Taught Seminar): S (2 weekly contact hours), German or English, details on availability to be announced FOKUS Miniforschungsprojekt (FOKUS Mini Research Project): P (2 weekly contact hours), German or English, details on availability to be announced						
		s essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
1. Topio tes) o repo 2. Semi	cs cove or oral o rt (appi inar: ta	as the following assest red in lectures and exe examination of one car rox. 8 pages) lk (approx. 30 to 45 min roject: project report (a	rcises: written examina didate each or oral exa nutes)			
Studen Details	ts mus on whe	omponents 1 and 3 will t register for assessme en assessment compor lodule, students must J	nt components 1 and 3 ents will be offered to	online (details to be be announced.		
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	9				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module		urs in				
mouul	- "hhee					
Master's wi	ith 1 majoı	FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 378 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 379 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title Abbreviation						
FOKUS	Resear	ch Module with Mini R	esearch Project		11-FM8A-MF-112-mc)1
Module	e coord	inator		Module offered by		
chairpe	erson of	f examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
16	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Specifi	c and a	dvanced knowledge of	independent scientific	work in a current re	search area.	
Intende	ed learr	ning outcomes				
The students have special and advanced knowledge of independent scientific work in a current research area. They have mastered the basics in theory and practice. They are able to reproduce the acquired knowledge, to ap- ply the acquired methods and to summarise a topic of the selected research area in an oral presentation. They are able to successfully implement the acquired methods in a mini research project and to write down the results in a report.						
		umber of weekly contact hours				
FOKUS Vorlesung zu aktuellen Forschungsthemen (FOKUS Lecture on Topics in Current Research): V (4 weekly contact hours) + Ü/P (2 weekly contact hours), German or English, details on availability to be announced FOKUS Kompaktseminar (FOKUS Block Taught Seminar): S (2 weekly contact hours), German or English, details on availability to be announced FOKUS Miniforschungsprojekt (FOKUS Mini Research Project): P (2 weekly contact hours), German or English, de- tails on availability to be announced				unced ish, details		
		e essment (type, scope, langu le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
1. Topio tes) repo 2. Sem	cs cove or oral e rt (appr inar: ta	as the following assess red in lectures and exer examination of one can 'ox. 8 pages) lk (approx. 30 to 45 mir oject: project report (ap	cises: written examina didate each or oral exa utes)			
Studen Details	its mus [.] on whe	omponents 1 and 3 will t register for assessmer en assessment compon odule, students must p	nt components 1 and 3 ents will be offered to	online (details to be be announced.		
Allocat	ion of p	olaces				
Additio	onal info	ormation				
Worklo	ad					
Teachi	ng cycl	9				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	rs in				
Master's w	ith 1 major	FOKUS Physics (2010)		• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys		page 380 / 389

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 381 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title			Abbreviation			
FOKUS Research Module Topology in Solid State Physics 11-FM-TFP-141-m01					11-FM-TFP-141-m01	
Module	coord	inator		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)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Specific special		_	dependent scientific	work in a current re	search area, especially in the	
Intende	ed learr	ning outcomes				
The stu	dents ł	nave special and advance	ed knowledge of inde	pendent scientific w	ork in a current research area.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
contact Kompal (2 week	hour), ktsemi kly cont	German or English, once nar Topologie in der Festl	a year (summer sem körperphysik (Block 1 glish, details on ava	ester) Taught Seminar Topo	contact hours) + Ü/P (1 weekly plogy in Solid State Physics): S nced (block taught seminar (3	
Method	l of ass	sessment (type, scope, langua		examination offered — if no	t every semester, information on whether	
		le for bonus)				
1. Topic tes) c repoi	s cove or oral e t (appr		ises: written examina date each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project	
Studen Assess ponent To pass	ts mus ment co 2 will t 5 this m	be offered to be announc odule, students must pa	components 1 and 2 ed once a year in the s ed.	online (details to be summer semester; d	etails on when assessment com-	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	Workload					
Teachir	ig cycl	9				
 D-f	44. 1					
Referred to in LPO I (examination regulations for teaching-degree programmes)						
 Module appears in						
		ee (1 major) FOKUS Physi	(2010)			
	-	ee (1 major) FOKUS Physi				
	- 0-	. , ,	. /			

Module title Abbreviation						
FOKUS	FOKUS Research Module Topology in Solid State Physics with Mini Researc			ith Mini Research	11-FM-TFP-MF-141-m	101
Project						
Module	coord	inator		Module offered by		
chairpe	rson of	examination committe	e	Faculty of Physics a	nd Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
14	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
•		dvanced knowledge of I of topology in Solid-St		work in a current res	search area, especia	lly in the
Intende	ed learr	ning outcomes				
		nave special and advan Ilid-State Physics.	ced knowledge of inde	pendent scientific w	ork in a current rese	arch area of
Courses	5 (type, n	umber of weekly contact hours	, language — if other than Ger	man)		
contact Kompal (2 week days), u Minifors sics): P during s Method module is This mo 1. Topic tes) o repor 2. Semi 3. Reses Student Assessi ponents	hour), ktsemin sly cont usually schung (2 wee semest l of ass creditab odule h cs cove or oral e t (appr nar: tal arch pr ment co ts musi ment co s 2 and	er Festkörperphysik (To German or English, one nar Topologie in der Fes cact hours), German or I held during semester b sprojekt Topologie in d kly contact hours), Ger er break or approx. 3 w essment (type, scope, lange le for bonus) as the following assess red in lectures and exel examination of one can tox. 8 pages) lk (approx. 30 to 45 mir oject: project report (ap pomponents 1 through 3 t register for assessment omponent 1 will be offe d 3 will be offered to be nodule, students must p	ce a year (summer sem stkörperphysik (Block T English, details on avai oreak) er Festkörperphysik (N man or English, details eeks part time) uage – if other than German, e sment components rcises: written examina didate each or oral exa hutes) oprox. 8 pages) will be offered in Germ at components 1 throug red once a year in the s announced.	ester) aught Seminar Topo lability to be annour lini Research Project on availability to be examination offered — if no ation (approx. 90 min mination in groups of han or English. gh 3 online (details to summer semester; d	ology in Solid State P nced (block taught s Topology in Solid S announced (either l t every semester, informati nutes) or talk (approx (approx. 30 minutes) o be announced). etails on when asses	Physics): S eminar (3 tate Phy- block taught on on whether x. 30 minu-) or project
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
Teachir	ng cycle	9				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
Master's wi	th 1 major	FOKUS Physics (2010)		• generated 26-Aug-2024 • e aster (120 ECTS) FOKUS Phys		page 383 / 389

Module appears in

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

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 384 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

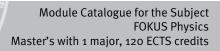
Module title					Abbreviation		
FOKUS Research Module Quantum Information Technology 11-FM-QUI-141-mo1							
Module coordinator				Module offered by			
Managi	ing Dire	ector of the Institute of	Applied Physics	oplied Physics Faculty of Physics and Astronomy			
ECTS Method of grading			Only after succ. con	Only after succ. compl. of module(s)			
10	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
proach	es towa	s of quantum mechani ards quantum computi noise, quantum inform	ng (on the basis of pho	tons, ions and nucle			
Intende	ed lear	ning outcomes					
The students have special and advanced knowledge of independent scientific work in the field of quantum infor- mation, they are able to reproduce the acquired knowledge, to apply the acquired methods, to summarise a sub- area of the current research area in an oral presentation and to successfully implement the acquired knowledge and methods in a mini research project.							
Course	S (type, r	number of weekly contact hour	s, language — if other than Ge	rman)			
Quanteninformationstechnologie (Quantum Information Technology): V (3 weekly contact hours) + Ü/P (1 weekly contact hour), German or English, once a year (winter semester) Kompaktseminar Quanteninformationstechnologie (Block Taught Seminar Quantum Information Technology): S (2 weekly contact hours), German or English, details on availability to be announced (block taught seminar (3 days), usually held during semester break)							
Method	d of ass	sessment (type, scope, lang	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether	
module is	creditab	le for bonus)					
 This module has the following assessment components 1. Topics covered in lectures and exercises: written examination (approx. 90 minutes) or talk (approx. 30 minutes) or oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or project report (approx. 8 pages) 2. Seminar: talk (approx. 30 to 45 minutes) 							
Assessment components 1 and 2 will be offered in German or English. Students must register for assessment components 1 and 2 online (details to be announced). Assessment component 1 will be offered once a year in the winter semester; details on when assessment compo- nent 2 will be offered to be announced. To pass this module, students must pass both assessment component 1 and assessment component 2.							
Allocation of places							
Additional information							
Workload							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	appea	urs in					
Master's wi	th 1 majo	r FOKUS Physics (2010)	-	• generated 26-Aug-2024 • e laster (120 ECTS) FOKUS Phys	-	page 385 / 389	

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

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	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title					Abbreviation	
FOKUS Heteros		rch Module Density Func re	tional Theory and the	Physics of Oxide	11-FM-DFT-142-m01	
Module	e coord	inator		Module offered by		
chairpe	erson o	f examination committee		Faculty of Physics a	and Astronomy	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
8	nume	rical grade		-		
Duration Module level		Other prerequisites				
1 semester graduate		Recommended: 11-CMS				
Contents						
Concep	ts and	principles of density fun	ctional theory.			
Intende	ed lear	ning outcomes				
The stu	dents l	know the concepts and p	rinciples of density fu	unctional theory.		
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
ar (wint Kompa Density	ter sem ktsemi v Functi	ester) nar Dichtefunktionaltheo onal Theory and Physics	rie und Physik der ox of Oxide Heterostruc	idischen Heterostru tures): S (2 weekly c	ır), German or English, once a ye- kturen (Block Taught Seminar ontact hours), German or English held during semester break)	
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	ot every semester, information on whether	
1. Topic tes) c repo	cs cove or oral rt (appi		ises: written examina idate each or oral exa		nutes) or talk (approx. 30 minu- (approx. 30 minutes) or project	
Studen Assess nent 2 y	ts mus ment c will be	offered to be announced	components 1 and 2 ed once a year in the v	online (details to be winter semester; det	e announced). tails on when assessment compo ssessment component 2.	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
Module	e appea	ars in				
	-	ee (1 major) FOKUS Physi				
Master	's degr	ee (1 major) FOKUS Physi	cs (2011)			





Thesis (30 ECTS credits)

Master's with 1 major FOKUS Physics (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 388 / 389
	data record Master (120 ECTS) FOKUS Physik - 2010	

Module title					Abbreviation	
Master Thesis FOKUS Physics 11-MA-PF-072-m01						
Module coordinator				Module offered by		
chairperson of examination committee				Faculty of Physics and Astronomy		
ECTS	ECTS Method of grading		Only after succ. compl. of module(s)			
30	o numerical grade					
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate	Registration for assessment to be carried out electronically. Deadlines will be announced separately. Please consult with your supervisor.		-	
Conten	ts					
					nt research area of Experimental aspects; writing of the thesis.	
Intende	ed learı	ning outcomes				
The students are able to independently work on an experimental or theoretical task from a current research area of Theoretical Physics, especially in accordance with known methods and scientific aspects and to summarise their results in a final paper.						
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
no cou	rses as	signed				
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	thesis	(approx. 40 pages)				
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master's degree (1 major) FOKUS Physics (2010) Master's degree (1 major) FOKUS Physics (2006)						
master's degree (1 major) fokus physics (2006)						