

## **Annex SFB**

## Studienfachbeschreibung (subject description, SFB) for the subject Quantum Engineering as a Master's with 1 major with the degree "Master of Science" (120 ECTS credits)

Responsible: Faculty of Physics and Astronomy

Examination regulations version: 2024

Abbreviations used: Course types: **E** = field trip, **K** = colloquium, **O** = conversatorium, **P** = placement/lab course, **R** = project, **S** = seminar, **T** = tutorial, **Ü** = exercise, **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 for the modules in this SFB:

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Information on assessment procedures:

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 a 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:

## ASP02015

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

## 06-Sep-2023 (2023-71)

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.

Every module will be described using the following form:

Abbreviation	Module title										
	ECTS		Duration	(in semesters)	Method of grading		Module level				
	Courses		To be spe	To be specified in the form X (y) with course type X abbreviated as specified above and number of weekly contact hours y							
	Method of as	ssessm	ent								
	Only after su completion of		ıl if applica	if applicable							
	Other prereq	uisites	if applica	if applicable							
	Participants on of places		ocati- if applica	if applicable							
	Additional in	Additional information		if applicable							
	Referred to in	n LPO I	if applica	if applicable (examination regulations for teaching-degree programmes)							

Electives Field (60	ECTS credits)										
Subfield Quantum	ور5) Engineering	5 ECTS cre	dits)								
Advanced Laborato	ry Courses (9 E	CTS credi	ts)								
11-P-FM1-Int-201-	Advanced Lab	oratory Co	ourse M	Master Part 1							
mo1	ECTS 3	Duratio		1 semester	Method of grading	(not) successfully completed	Modul level	graduate			
	Courses		P (3) Modu	Module taught in: English							
	Method of ass	sessment	Stude an ex perim modu	practical examination Students must successfully prepare, perform, document (lab notebook) and evaluate (in the form of a scientific publication) an experiment to be considered to have successfully completed this experiment. Students must successfully complete two experiments to be considered to have successfully completed this module. Detailed regulations are laid down in the respective module description.  Language of assessment: English							
	other prerequ			ration and safety br	iefing.		,				
11-P-FM2-Int-201-				ourse Master Part 2							
mo1	ECTS 3	Duratio		1 semester	Method of grading	(not) successfully completed	Modul level	graduate			
	Courses		P (3) Modu	le taught in: English							
	Method of ass	sessment	practical examination Students must successfully prepare, perform, document (lab notebook) and evaluate (in the form of a scientific publication) an experiment to be considered to have successfully completed this experiment. Students must successfully complete two experiments to be considered to have successfully completed this module. Detailed regulations are laid down in the respective module description.  Language of assessment: English								
	other prerequ	isites	Preparation and safety briefing.								
11-P-FM3-Int-201-	Advanced Lab	oratory Co	ourse M	Master Part 3			,				
mo1	ECTS 3	Duratio		1 semester	Method of grading	(not) successfully completed	Modul level	graduate			
	Courses		P (3) Module taught in: English								
	Method of ass		practical examination Students must successfully prepare, perform, document (lab notebook) and evaluate (in the form of a scientific publication) an experiment to be considered to have successfully completed this experiment. Students must successfully complete two experiments to be considered to have successfully completed this module. Detailed regulations are laid down in the respective module description.  Language of assessment: English								
	other prerequi	isites	Prepa	ration and safety br	iefing.						

11-P-FM4-Int-201-	Advance	ed Labo	oratory Co	urse N	Master Part 4						
mo1	ECTS	3	Duration	1	1 semester	Method of grading	(not) successfully completed	Modul level	graduate		
	Courses	5	,	P (3) Modu	ıle taught in: Englis	h					
	Method	of asse	essment	Stude an ex perim modu	periment to be con	sidered to have succe red to have successfu	ssfully completed this experin	ent. Students n	e form of a scientific publication) nust successfully complete two ex- ns are laid down in the respective		
	other pr	erequis	sites	Prepa	aration and safety b	riefing.					
<b>Advanced Seminar</b>	(5 ECTS	credits)									
11-OSN-A-Int-201-	Advance	ed Sem	inar Quai	ntum E	ingineering A						
mo1	ECTS	5	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate		
	Courses			S (2) Module taught in: English							
	Method	of asse	essment		vith discussion (30 uage of assessmen						
11-OSN-B-Int-201-	Advanced Seminar Quantum Engineering B										
mo1	ECTS 5 Duration				1 semester	Method of grading	numerical grade	Modul level	graduate		
	Courses			S (2) Module taught in: English							
	Method of assessment			talk with discussion (30 to 45 minutes) Language of assessment: English							
Specialization Qua	ntum Eng	gineerii	ng								
11-HNS-Int-201-	Optical	Proper	ties of Se	micon	ductor Nanostructu	ires					
mo1	ECTS	6	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate		
	Courses			Modu	+ R (1) ıle taught in: Englis						
	Method	of asse	essment	oral e prese If a w form the le	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English						

11-HPH-Int-201-	Semico	nductor	Physics					"			
mo1	ECTS	6	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	graduate		
	Courses			V (3) - Modu	+ R (1) le taught in: English						
	Method	of asse	essment	oral e prese If a wi form of the le Asses	written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) ral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) resentation/talk (approx. 30 minutes).  a written examination was chosen as method of assessment, this may be changed and assessment may instead take the orm of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed ne lecturer must inform students about this by four weeks prior to the original examination date at the latest. ssessment offered: In the semester in which the course is offered and in the subsequent semester anguage of assessment: English						
11-QTR-Int-201-	Quantui	m Trans	sport					,			
m01	ECTS	6	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	graduate		
	Courses	i			(3) + R (1) odule taught in: English						
	Method	Method of assessment			a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is characteristic that the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English						
11-NOP-Int-201-	Nano-O	ptics						'			
mo1	ECTS	6	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate		
	Courses	i		V (3) + R (1) Module taught in: English							
	Method of assessment			a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English							

11-SPI-Int-201-m01	Spintro	onics			'			,				
	ECTS	6	Duration	1	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	?S			+ R (1) ıle taught in: Engli	sh						
				oral e prese If a w form the le Asses Lange	written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) oresentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed he lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester anguage of assessment: English							
11-BSV-Int-201- m01		and Sigr	nal Proce	ssing	in Physics							
	ECTS	6	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	es			/ (2) + Ü (2) Module taught in: English							
				oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pag presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English								
11-PMM-Int-201-	Physic	s of Adva	anced Ma	terial	<b>S</b>							
mo1	ECTS	6	Duration	1	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	es.		V (3) + R (1) Module taught in: English								
	Method	d of asse		oral e prese If a w form the le Asses	examination in gro entation/talk (apporiten examination of an oral examina ecturer must inforr	ups (groups of 2, approx. 30 minutes). It was chosen as metholation of one candidate in students about this the semester in which	ox. 30 minutes per cand d of assessment, this m	lidate) or d) project reponant be changed and assetion in groups. If the me original examination				

11-OHL-Int-201-	Organi	ic Semi	conductor	S			'						
mo1	ECTS	6	Duration	n	1 semester	Method of grading numerical grade	Modul level	graduate					
	Course	es			+ R (1)		,						
					ıle taught in: Englis								
	Metho	d of ass	sessment	a) wr	itten examination (	approx. 90 to 120 minutes) or ne candidate each (approx. 30 minutes) or							
						roups (groups of 2, approx. 30 minutes) of	late) or						
				d) pro	d) project report (approx. 8 to 10 pages) or								
					e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the orm of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, he lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: In the semester in which the course is offered and in the subsequent semester								
				Asses									
	_				uage of assessmen								
08-FU-SAM-161- mo1		_	-		-1	s and Magnetic Particles							
11101	ECTS	5	Duration		1 semester	Method of grading   numerical grade	Modul level	graduate					
	Course				V (2) + P (2)								
	Metho	d of ass	sessment		a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate)								
				Assessment offered: Once a year, summer semester									
				Langi	Language of assessment: German and/or English								
					P: creditable for bonus								
08-PCM4-161-m01					d quantum-control								
	ECTS	5	Duration		1 semester	Method of grading   numerical grade	Modul level	graduate					
	Course	es			S (2) + $\ddot{\text{U}}$ (1) Module taught in: German or English								
	Metho	d of ass	sessment			approx. 90 minutes) or b) oral examination of one	candidate each (a	pprox. 20 minutes) or c) talk (ap-					
					30 minutes)	t Carres and law English							
	oth or m		isitas			it: German and/or English lules o8-PCM1a and o8-PCM1b recommended.							
08-FU-EEW-222-	<del></del>	orerequ			•	lutes 08-PCM1a and 08-PCM1b recommended.							
08-FU-EEW-222-	ECTS		Duration		ge and Conversion  1 semester	Method of grading numerical grade	Modul level	undergraduate					
	Course	5	Duration			Method of grading   numerical grade	Modul level	undergraduate					
	Course	55		V (2) + S (2) Module taught in: German or English									
	Metho	d of ass	sessment			approx. 90 minutes) or oral examination of one ca	andidate each (app	rox. 30 minutes) and					
				b) talk (approx. 30 minutes); (weighted 65:35)									
				Language of assessment: German and/or English									
				Asses	Assessment offered: Once a year, summer semester								

08-FU-MW-222-	Structu	re-Prop	erties Cor	relatio	ons of Light Materia	s - Experiments and	Numerical Simulations				
mo1	ECTS	5	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate		
	Course	S		V (2) + S (2) Module taught in: German or English							
	Method	d of asso		a) written examination (approx. 90 minutes) or oral examination of one candidate each (approx. 30 minutes) and b) talk (approx. 30 minutes); (weighted 60:40) Language of assessment: German and/or English Assessment offered: Once a year, summer semester							
11-EXN5-Int-241-	Current	t Topics	in Quantu	ım Eng	gineering						
mo1	ECTS	5	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate		
	Courses			V (2) + Modu	- R (2) le taught in: English						
	Method of assessment			a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Language of assessment: English							
	other prerequisites			Approval from examination committee required.							
11-EXN6-Int-241-			in Quantu	um Engineering							
mo1	ECTS	6	Duration	n 1 semester Method of grading numerical grade Modul level graduate					graduate		
	Courses			V (3) + R (1) Module taught in: English							
	Method of assessment			a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Language of assessment: English							
	other p	rerequi	sites	Appro	val from examinatio	n committee require	d.				

11-EXN7-Int-241-	Current Topics in Quantum Engineering												
mo1	ECTS	7	Duration	n n	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	5			+ R (1) ule taught in: Engl	ish		,					
	Method	of ass	sessment	oral pres If a v form the l	written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) oresentation/talk (approx. 30 minutes). Fa written examination was chosen as method of assessment, this may be changed and assessment may instead take the orm of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. anguage of assessment: English								
	other p	rerequ	isites	Appr	oval from examina	ation committee requir	ed.						
11-EXN8-Int-241-	Current	Topic	s in Quant	um Er	gineering	,		'					
mo1	ECTS	8	Duration	1	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	5			V (4) + R (2) Module taught in: English								
		Method of assessment			oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is change the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: English								
	other p	rerequi	isites	Approval from examination committee required									
11-EXN6A-Int-241-		Topic	s in Quant	um Er	gineering								
mo1	ECTS 6 Duratio			า	1 semester	Method of grading	numerical grade						
			Duration			Method of grading		Modul level	graduate				
	Course		Duration	V (3)	+ R (1) ule taught in: Engl		Thumbreat 3.440	Modul level	graduate				
	Course	S		V (3) Mod a) wi oral pres If a v form the l	+ R (1) ule taught in: Engle itten examination examination in groe entation/talk (app vritten examination of an oral examin	ish (approx. 90 to 120 mir oups (groups of 2, appr rox. 30 minutes). In was chosen as methological methologic	nutes) or b) oral examinatiox. 30 minutes per candic	on of one candidate of late) or d) project rep y be changed and ass on in groups. If the m	each (approx. 30 minutes) or c) ort (approx. 8 to 10 pages) or e) sessment may instead take the ethod of assessment is changed,				

11-CSFM-Int-201-	Advanced Topics in Solid State Physics											
mo1	ECTS	6	Duration	ı	1 semester	Method of grading numerical grade	e	Modul level	graduate			
	Courses	S		V (3) +				- 8				
					le taught in: Englis							
	Method	l of ass	essment	oral e prese If a wr	xamination in grou ntation/talk (appro itten examination v	approx. 90 to 120 minutes) or b) oral exps (groups of 2, approx. 30 minutes pex. 30 minutes).  Was chosen as method of assessment, ion of one candidate each or an oral expenses.	er candidate) o c, this may be c	r d) project repo	ort (approx. 8 to 10 pages) or e) sessment may instead take the			
					ne lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Anguage of assessment: English							
	other p	rerequi	sites	Appro	Approval from examination committee required.							
11-CSNM-Int-241-	Advanc	ed Topi	ics in Qua	ntum E	ingineering							
mo1	ECTS 6 Duratio			ı	1 semester	Method of grading numerical grade	e	Modul level	graduate			
	Courses				le taught in: Englis	h upprox. 90 to 120 minutes) or						
				c) ora d) pro e) pre If a wr form o the le Langu	b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: English							
	other p			Approval from examination committee required.								
11-FK2-Int-201-m01					1							
		8	Duration		1 semester	Method of grading   numerical grade	e	Modul level	graduate			
	Courses				le taught in: Englis							
				a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English								
	other p	rerequi	sites	Appro	val from examinati	on committee required.						

11-EIM-Int-201-	Electron and Ion Microscopy												
mo1	ECTS 6 Durat	ion 1 semester	Method of grading numerical grade	Modul level	graduate								
	Courses	V (3) + R (1) Module taught in: Er	glish	·									
	Method of assessmen	b) oral examination of c) oral examination if d) project report (apple) presentation/talk If a written examinat form of an oral examinat the lecturer must informage of assessr	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: English  Assessment offered: In the semester in which the course is offered and in the following semester										
11-CSPM-Int-201-	Advanced Topics in Physics												
mo1	ECTS 6 Durat	ion 1 semester	Method of grading numerical grade	Modul level	graduate								
	Courses	V (3) + R (1) Module taught in: Er	glish										
	Method of assessmen	oral examination in g presentation/talk (a If a written examinat form of an oral exam the lecturer must info	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Language of assessment: English										
	other prerequisites		nation committee required.										
11-FKS-Int-201-m01	Solid State Spectroco	· · · · · · · · · · · · · · · · · · ·											
	ECTS 6 Durat		Method of grading   numerical grade	Modul level	graduate								
	Courses	V (3) + R (1) Module taught in: Er											
	Method of assessmer	oral examination in a presentation/talk (a If a written examinat form of an oral exam the lecturer must inf	ion was chosen as method of assessment, this m ination of one candidate each or an oral examina orm students about this by four weeks prior to th In the semester in which the course is offered ar	didate) or d) project reponant of the changed and assation in groups. If the mage original examination of	sessment may instead take the ethod of assessment is changed, date at the latest.								

11-TEFK-Int-201-	Topolo	gical Eff	ects in So	olid St	ate Physics			,				
mo1	ECTS	8	Duration	ı	1 semester	Method of grading r	umerical grade	Modul level	graduate			
	Course	S			+ R (2) ıle taught in: English	l						
	Method	d of asse		oral e prese If a w form the le Asses	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) oresentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester canguage of assessment: English							
11-FFK-Int-201-m01	Field TI	heory in	Solid Sta	te Ph	ysics							
	ECTS 8 Duratio			ı	1 semester	Method of grading r	umerical grade	Modul level	graduate			
	Courses  Method of assessment				(4) + R (2) lodule taught in: English							
	Method	J OI d55C		oral e prese If a w form the le Asses	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is change the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English							
11-AKTF-Int-201-	Selecte	ed Topics	of Theo	retica	Solid State Physics			,				
mo1	ECTS	6	Duration	ı	1 semester	Method of grading r	umerical grade	Modul level	graduate			
	Course	S		V (3) + R (1) Module taught in: English								
	Method	d of asse		a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English								

11-MAG-Int-201-	Magne	tism						,				
mo1	ECTS	6	Duration	ı	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	·S			+ R (1) ıle taught in: English	1						
	Method	d of asse	essment	oral e prese If a w form the le Asse	written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) oresentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the orm of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester anguage of assessment: English							
11-QM2-Int-201- m01	Quantı	ım Mech	anics II									
	ECTS 8 Duration			ı	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses				V (4) + R (2) Module taught in: English							
	Method of assessment			oral e prese If a w form the le Asse	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minute oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 page presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead t form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English							
11-TQO-Int-221-	Theore	tical Qu	antum Op	otics								
mo1	ECTS	8	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	·S		V (4) + R (2) Module taught in: English								
	Method	d of asse	essment	written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English								

11-TFK-Int-201-m01	Theore	tical Sc	lid State	Physic	:s			-			
	ECTS	8	Duration	n	1 semester	Method of grading	numerical grade	Modul level	graduate		
	Course	es			V (4) + R (2) Module taught in: English						
				a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English							
11-PTS-Int-201-					f Superconductivi	<u> </u>					
mo1	ECTS 6 Duration			1	1 semester	Method of grading	numerical grade	Modul level	graduate		
	Courses			V (3) + R (1) Module taught in: English							
	method of discosment			a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English							
11-QIC-Int-201-m01		ced The	ory of Qua	antum	Computing and Q	uantum Information					
	ECTS	6	Duration	1	1 semester	Method of grading	numerical grade	Modul level	graduate		
	Course	Courses			V (3) + R (1) Module taught in: English						
	Method	d of ass	essment	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English							

11-MRI-Int-201-	Advanc	Advanced Magnetic Resonance Imaging											
mo1	ECTS	6	Duration	า	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Courses				V (3) + R (1) Module taught in: English								
	Method	d of ass	essment	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English									
11-SSC-Int-201-	Surface	Scienc	:e										
mo1	ECTS	6	Duration	1	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Courses			V (3) + R (1) Module taught in: English									
	Method of assessment			oral e prese If a wr form o the le Asses	xamination in group ntation/talk (appro itten examination v of an oral examinati cturer must inform	os (groups of 2, approx. 30 minutes). vas chosen as methodon of one candidate of students about this be semester in which	utes) or b) oral examination of ox. 30 minutes per candidate) odd of assessment, this may be cleach or an oral examination in good four weeks prior to the originathe course is offered and in the	r d) project repo hanged and ass groups. If the m al examination o	sessment may instead take the ethod of assessment is changed, date at the latest.				
11-FPA-Int-201-m01	Visitin	g Resea	rch										
	ECTS	10	Duration	1		Method of grading	numerical grade	Modul level	graduate				
	Course	S		R (o) Module taught in: English									
	Method of assessment			project report (10 to 20 pages) Language of assessment: English									
	other p	other prerequisites			val from examination	on committee require	d.						

11-EXP5-Int-201-	Current Topics in Physics											
mo1	ECTS 5	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Courses			V (2) + R (2) Module taught in: English								
	Method of a	ssessment	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Language of assessment: English									
	other prereq			oval from examination	on committee requir	ed.						
11-EXP6-Int-201-	<b>Current Topi</b>	cs in Physic	:s									
mo1	ECTS 6	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Courses		V (3)	+ R (1)								
			pres If a v form the l Lang	oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or opresentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take th form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: English								
	other prereq		Approval from examination committee required.									
11-EXP7-Int-201-	Current Topics in Physics											
mo1	ECTS 7	Duratio		1 semester	Method of grading	numerical grade	Modul level	graduate				
	Courses		V (3) + R (1) Module taught in: English									
	Method of a		a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: English									
	other prereq	uisites	Appr	oval from examination	on committee requir	ed.	,					

11-EXP8-Int-201-	Current Topics in Physics										
mo1	ECTS	8	Duration	1	1 semester	Method of grading numerical grade	Modul level	graduate			
	Course	S		V(4) + R(2)							
					le taught in: Engli						
				a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Language of assessment: English							
	other prerequisites				oval from examinat	tion committee required.					
11-EXP6A-Int-201-		t Topics	in Physic								
mo1	ECTS	6	Duration		1 semester	Method of grading   numerical grade	Modul level	graduate			
	Courses				V (3) + R (1) Module taught in: English						
				a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Language of assessment: English							
	other p	rerequi	sites	Approval from examination committee required.							
Subfield Nontechni	ical Mind	ors									
10-M-VAN-222-	Advanc	ed Ana	lysis								
mo1	ECTS	10	Duration	1	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S		V (4) ·	+ Ü (2)	•	*				
	Method of assessment			a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus							

10-M=VDI-	Discrete Mathematics											
Min-152-m01	ECTS	5	Duration	า	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	:S			V (3) + Ü (1) Module taught in: English							
	Method	d of ass	essment	minu Asses Langi	a) written examination (approx. 60 to 90 minutes, usually chosen) or b) oral examination of one candidate each (approx. 15 minutes) or c) oral examination in groups (groups of 2, approx. 10 minutes per candidate) Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English creditable for bonus							
10-l=QC-221-m01	Quantum Communications											
	ECTS	5	Duration	1	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			+ V (2) ule taught in: Engli	sh						
	Method	d of ass	essment	If anr of on date) Langi	written examination (approx. 60 to 120 minutes) If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).  Language of assessment: English creditable for bonus							
	Additio	nal Info	ormation	Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR								
10-I-APR-172-m01	Advanced Programming											
	ECTS	5	Duration	ı	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	:S		V (2)	+ Ü (2)							
	Method	d of ass	essment	written examination (approx. 60 to 120 minutes).  If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).  Language of assessment: German and/or English creditable for bonus								
10-l=DB-161-m01	Databa	ises										
	ECTS	5	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course			` ,	+ Ü (2)							
				written examination (approx. 60 to 120 minutes).  If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).  Separate written examination for Master's students.  Language of assessment: German and/or English creditable for bonus								
	Additio	nal Info	ormation	Focus	ses available for st	udents of the Master's	programme Informatik	k (Computer Science, 120	o ECTS credits): SE, IS, HCI, GE.			

10-I-BS-191-m01	Operating Systems											
	ECTS	5	Duration	n	1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Course	S	-		$V(2) + \ddot{U}(2)$							
				Module taught in: English								
	Method	d of ass	essment	written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus								
10-l=Kl1-212-m01	Artifici	al Intell	igence 1	ļ.								
	ECTS	5	Duration	1	1 semester	Method of grading numerical grade	Modul level	graduate				
	Course	S		V (2)	+ Ü (2)	,		-				
	Metrio	u oi ass	Cooment	written examination (approx. 60 to 120 minutes) If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).  Language of assessment: German and/or English creditable for bonus								
	Additio	nal Info	rmation	Focus	Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT,SE,KI,HCI							
02-N-Ö-	Environmental Law											
W2-05-152-m01	ECTS	3	Duration	า	1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Course		_	V (2)								
	Method	d of ass	essment	a) written examination (approx. 120 minutes) or b) oral examination (approx. 15 minutes) Assessment offered: Usually every two years, winter semester								
	other p	rerequi	sites	Prior completion of the following module is recommended: 02-N-Ö-V								
11-AP-Int-201-m01	Astrop	<u> </u>	,									
	ECTS	6	Duration		1 semester	Method of grading   numerical grade	Modul level	undergraduate				
	Course	!S		V (2) + R (2) Module taught in: English								
	Method	d of ass	essment	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English								

11-ASM-Int-201-	Methods of Observational Astronomy											
mo1	ECTS	6 Duratio	n	1 semester	Method of grading numerical grade	Modul level	graduate					
	Courses	7		+ R (1) ule taught in: English	1							
	Method	of assessment	oral oral oral oral oral oral oral oral	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English								
11-ASP-Int-201-	Introduc	tion to Space F	hysics	}								
mo1	ECTS	6 Duratio	n	1 semester	Method of grading numerical grade	Modul level	graduate					
	Courses	,		V (3) + R (1) Module taught in: English								
	метпоа	of assessment	oral oral oral oral oral oral oral oral	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is change the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English								
11-EXZ5-Int-201-	Nontech	nical Special T	opics									
mo1	ECTS	5 Duratio	n	1 semester	Method of grading numerical grade	Modul level	graduate					
	Courses		V (2) + R (2) Module taught in: English									
		of assessment	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Language of assessment: English  Approval from examination committee required.									

11-EXZ6-Int-201-	Nonted	Nontechnical Special Topics											
mo1	ECTS	6	Duration	n	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	!S	•		V (3) + R (1)								
				Module taught in: English									
				oral e prese If a w form the le Langu	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: English								
	-	rerequi			oval from examinat	tion committee requir	ed.						
11-EXNT6-Int-201-	Nonted	hnical	Minor Sub	ject									
mo1	ECTS	6	Duration	n	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Courses				V (3) + R (1) Module taught in: English								
	Wetho	Method of assessment			a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Language of assessment: English								
	other p	rerequi	sites	Approval from examination committee required.									
Master Project Mo	dules (6	lules (60 ECTS credits)											
11-FS-N-Int-201-	Professional Specialization Quantum Engineering												
mo1	ECTS	15	Duration	n	1 semester	Method of grading	(not) successfully comp	leted Modul level					
	Course	es	•	S (4) Modu	le taught in: Englis	sh	•						
	Method of assessment			talk with discussion (30 to 45 minutes) Language of assessment: English									
11-MP-N-Int-201-	Scient	ific Met	hods and	Project Management Quantum Engineering									
mo1	ECTS	15	Duration	n	1 semester	Method of grading	(not) successfully comp	leted Modul level					
	Course	Courses			R (4) Module taught in: English								
	Metho	Method of assessment			talk with discussion (30 to 45 minutes) Language of assessment: English								

11-MA-N-Int-201-	Master	Master Thesis Quantum Engineering										
mo1	ECTS	30	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			urses assigned le taught in: English							
	Method of assessment				r's thesis (750 to 90 age of assessment:							
	Additio	nal Info	rmation									