



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: $\mathbf{E} = \text{field trip}$, $\mathbf{K} = \text{colloquium}$, $\mathbf{O} = \text{conversatorium}$, $\mathbf{P} = \text{placement/lab course}$, $\mathbf{R} = \text{project}$, $\mathbf{S} = \text{seminar}$, $\mathbf{T} = \text{tutorial}$, $\mathbf{\ddot{U}} = \text{exercise}$, \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) Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not cre-Conventions for the modules in this SFB: ditable for bonus. Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the me-Information on thod 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 assessment procedures: 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:

ASPO2015

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	cified in the form X	(y) with course type λ	(abbreviated as specified abo	ve and number of we	ekly contact hours y		
	Method of as	ssessme	ent							
	Only after su completion of		l if applica	ble						
	Other prereq	uisites	if applica	ble						
	Participants an on of places		ocati- if applica	ble						
	Additional in	formatio	on if applica	if applicable						
	Referred to in	n LPO I	if applica	ble (examination re	gulations for teaching	g-degree programmes)				

Electives Field (60	ECTS credits)	
Subfield Quantum	Engineering (55 ECTS cre	dits)
Advanced Laborat	ory Courses (9 ECTS credi	ts)
11-P-FM1-Int-201-	Advanced Laboratory Co	ourse Master Part 1
m01	ECTS 3 Duratio	
	Courses	P (3) Module taught in: English
	Method of assessment	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 ex- periments to be considered to have successfully completed this module. Detailed regulations are laid down in the respective module description. Language of assessment: English
	other prerequisites	Preparation and safety briefing.
11-P-FM2-Int-201-	Advanced Laboratory Co	ourse Master Part 2
m01	ECTS 3 Duratio	n 1 semester Method of grading (not) successfully completed Modul level graduate
	Courses	P (3) Module taught in: English
	Method of assessment	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 ex- periments to be considered to have successfully completed this module. Detailed regulations are laid down in the respective module description. Language of assessment: English
	other prerequisites	Preparation and safety briefing.
11-P-FM3-Int-201-	Advanced Laboratory Co	ourse Master Part 3
m01	ECTS 3 Duratio	
	Courses	P (3) Module taught in: English
	Method of assessment	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 prerequisites	Preparation and safety briefing.

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11-P-FM4-Int-201-	Advanced Laboratory Course Master Part 4										
m01	ECTS 3	Duratio	n	1 semester	Method of grading	(not) successfully completed	Modul level	graduate			
	Courses		P (3)	•	•		•	·			
				Nodule taught in: English							
	Method of	assessment		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 ex-							
			perim	periments to be considered to have successfully completed this module. Detailed regulations are laid down in the respective							
				module description.							
	other prere	auisites		Language of assessment: English Preparation and safety briefing.							
Advanced Seminar	· · · · · · · · · · · · · · · · · · ·	-	Гісра								
11-OSN-A-Int-201-			ntum F	ngineering A							
mo1	ECTS 5	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Courses	Duration	S (2)	1 Semester	Method of grading		Modulievei				
	courses			Module taught in: English							
	Method of	assessment		talk with discussion (30 to 45 minutes)							
			Language of assessment: English								
11-OSN-B-Int-201-				ngineering B		<u> </u>	1	·			
m01	ECTS 5	Duratio		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Courses			Module taught in: English							
	Method of	assessment	talk w	talk with discussion (30 to 45 minutes) Language of assessment: English							
Specialization Qua	ntum Engina	ooring	Lange		Liigiisii						
11-HNS-Int-201-			micon	ductor Nanostructur							
mo1	ECTS 6	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Courses		V (3) ·	l	method of studing	numerical grade	modulievel	Sidduce			
	courses			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)							
				xamination in group ntation/talk (approx		<. 30 minutes per candidate) o	r d) project repo	ort (approx. 8 to 10 pages) or e)			
						of assessment, this may be cl	hanged and ass	sessment may instead take the			
			form	of an oral examinatio	on of one candidate e	ach or an oral examination in §	groups. If the m	ethod of assessment is changed,			
						four weeks prior to the originate of the originate for the originate of the fourse is offered and in the					
				lage of assessment:		ne course is onered and in the	subsequent se	emester			
				J							

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11-HPH-Int-201-	Semico	nducto	r Physics									
m01	ECTS	6	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			V (3) + R (1) Module taught in: English							
	Methoo	l of ass	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) 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). Ta 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 anguage of assessment: English							
11-QTR-Int-201-	Quantu	ım Tran	sport				-					
m01	ECTS	6	Duratio		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			+ R (1) Jle taught in: Eng	lish						
	Method	1 01 455	essment	oral e prese If a w form the le Asse	examination in gr entation/talk (ap ritten examination of an oral examir ecturer must info	roups (groups of 2, approprox. 30 minutes). on was chosen as methonation of one candidate or students about this bon the semester in which	ox. 30 minutes per ca d of assessment, this each or an oral exam y four weeks prior to	Indidate) or d) project rep s may be changed and as:				
11-NOP-Int-201-	Nano-O	ptics										
m01	ECTS	6	Duratio	ı	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			+ R (1) Jle taught in: Eng	lish						
	Methoo	l of ass	essment	oral e prese If a w form the le Asse	examination in gr entation/talk (ap ritten examination of an oral examir ecturer must info	roups (groups of 2, approprox. 30 minutes). on was chosen as methonation of one candidate or students about this bon the semester in which	ox. 30 minutes per ca d of assessment, this each or an oral exam y four weeks prior to	Indidate) or d) project rep s may be changed and as:				

11-SPI-Int-201-m01	Spintro	onics										
	ECTS	6	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			+ R (1) ule taught in: Eng	lish						
				oral e prese If a w form the le Asse Lang	anguage of assessment: English							
11-BSV-Int-201-		and Sig	nal Proce	ssing	in Physics							
m01	ECTS	6	Duratio		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			+ Ü (2) ule taught in: Eng	lish						
	Method	of ass	essment	oral e prese If a w form the le Asse	examination in gr entation/talk (app vritten examinatic of an oral examir ecturer must infor	oups (groups of 2, appro prox. 30 minutes). on was chosen as metho nation of one candidate of rm students about this b n the semester in which	ox. 30 minutes per ca d of assessment, thi each or an oral exam y four weeks prior to	andidate) or d) project rep s may be changed and as				
11-PMM-Int-201-	Physics	s of Adv	vanced Ma	terial	s							
m01	ECTS	6	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S		V (3) + R (1) Module taught in: English								
	Methoo	d of ass	essment	oral e prese If a w form the le Asse	examination in gr entation/talk (app vritten examinatic of an oral examir ecturer must infor	oups (groups of 2, appro prox. 30 minutes). on was chosen as metho nation of one candidate or rm students about this b n the semester in which	ox. 30 minutes per ca d of assessment, thi each or an oral exam y four weeks prior to	andidate) or d) project rep s may be changed and as				

11-0HL-Int-201-	Organi	ic Semic	conductor	s							
m01	ECTS	6	Duratio	n	1 semester Method of grading numerical grade Modul level graduate						
	Course	!S			V (3) + R (1) Module taught in: English						
	Methoo	d of ass	essment	b) ora c) ora d) pro e) pre If a w form the le Asses	al examination of c al examination in g oject report (appro esentation/talk (ap ritten examination of an oral examina ecturer must inform	groups (groups of 2, a ex. 8 to 10 pages) or oprox. 30 minutes). In was chosen as met ation of one candida In students about this the semester in whi	(approx. 30 minutes) approx. 30 minutes p hod of assessment, 1	ber candidate this may be c amination in g r to the origina	hanged and as groups. If the m al examination		
08-FU-SAM-161-	Sensor	r <mark>and Ac</mark>	tor Mater	ials - F	unctional Ceramic	s and Magnetic Par	ticles				
m01	ECTS	5	Duratio	n	1 semester	Method of gradir	ng numerical grade		Modul level	graduate	
	Courses			V (2)	/ (2) + P (2)						
				a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral ex- amination in groups (groups of 2, approx. 30 minutes per candidate) Assessment offered: Once a year, summer semester Language of assessment: German and/or English P: creditable for bonus							
08-PCM4-161-m01					antum-control						
	ECTS	5	Duration	ก	1 semester	Method of gradir	ng numerical grade		Modul level	graduate	
	Courses			S (2) + Ü (1) Module taught in: German or English							
	Method of assessment			a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) talk (approx. 30 minutes) Language of assessment: German and/or English							
	other p	orerequi	sites	Prior completion of modules o8-PCM1a and o8-PCM1b recommended.							
08-FU-EEW-222-	Electro	chemic	al Energy	Storag	ge and Conversion						
m01	ECTS 5 Duratio				1 semester	Method of gradin	ng numerical grade		Modul level	undergraduate	
	Courses			V (2) + S (2) Module taught in: German or English							
	Methoo	d of ass	essment	b) tal Langi	k (approx. 30 minu uage of assessmer	(approx. 90 minutes utes); (weighted 65: nt: German and/or E nce a year, summer s	35) nglish	n of one candi	idate each (app	rox. 30 minutes) and	

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08-FU-MW-222-	Structure-Prop	perties Corr	elations o	of Light Materia	ls - Experiments and	Numerical Simulations					
m01	ECTS 5	Duration	1 Se	emester	Method of grading	numerical grade	Modul level	graduate			
	Courses			(2) + S(2)							
				aught in: Germar							
	Method of ass		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								
					e a year, summer ser						
11-EXN5-Int-241-	Current Topics	in Quantu	n Engineering								
m01	ECTS 5	Duration	1 Se	emester	Method of grading	numerical grade	Modul level	graduate			
	Courses			(2) + R(2)							
			lodule taught in: English								
	Method of ass		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).								
		i	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 prerequi		Approval from examination committee required.								
11-EXN6-Int-241-	Current Topics	in Quantu	um Engineering								
m01	ECTS 6	Duration	1 Se	emester	Method of grading	numerical grade	Modul level	graduate			
	Courses		V (3) + R (1) Module taught in: English								
	Method of ass	essment a	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c)								
						ox. 30 minutes per candidate	e) or d) project repo	ort (approx. 8 to 10 pages) or e)			
				tion/talk (approx		d of accordmont this may b	o changed and acc	sessment may instead take the			
		t	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.								
				of assessment:							
	other prerequi	sites A	Approval f	from examinatio	on committee require	d.					

11-EXN7-Int-241-	Curren	t Topic	s in Quant	um Er	ngineering							
m01	ECTS	7	Duration	ı	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			V (3) + R (1) Module taught in: English							
	Metho	d of ass	sessment	oral pres If a v form the l	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). f 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. anguage of assessment: English							
	other p	rerequ	isites	Appr	roval from examina	ation committee require	d.					
11-EXN8-Int-241-	Curren	t Topic	s in Quant	um Er	ngineering							
m01	ECTS	8	Duration	า	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			(4) + R (2) odule taught in: English							
				oral pres If a v form the l Lang	examination in gro entation/talk (app vritten examinatio of an oral examin ecturer must infor uage of assessme	oups (groups of 2, appro prox. 30 minutes). n was chosen as metho ation of one candidate o m students about this b ent: English	ox. 30 minutes per car d of assessment, this each or an oral exami y four weeks prior to t	ndidate) or d) project repo may be changed and ass	each (approx. 30 minutes) or c) ort (approx. 8 to 10 pages) or e) sessment may instead take the ethod of assessment is changed, date at the latest.			
	other p					ation committee require	d					
11-EXN6A-Int-241-		· · ·			ngineering							
m01	ECTS Course	6 s	Duration	V (3)	1 semester + R (1) ule taught in: Engl	Method of grading	numerical grade	Modul level	graduate			
				oral pres If a v form the l Lang	examination in gro entation/talk (app vritten examinatio of an oral examin ecturer must infor guage of assessme	oups (groups of 2, appro rox. 30 minutes). n was chosen as metho ation of one candidate o m students about this b ent: English	ox. 30 minutes per car d of assessment, this each or an oral exami y four weeks prior to t	ndidate) or d) project repo may be changed and ass	each (approx. 30 minutes) or c) ort (approx. 8 to 10 pages) or e) sessment may instead take the ethod of assessment is changed, date at the latest.			
	other p	orerequ	isites	Appr	roval from examina	ation committee require	d.					

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11-CSFM-Int-201-	Advanc	ed Top	ics in Soli	d State	e Physics								
m01	ECTS	6	Duratior	1	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	S		V (3) + R (1) Module taught in: English									
	Method of assessment			oral exprese prese If a wr form o 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. Language of assessment: English								
	other p	rerequi	sites	Appro	Approval from examination committee required.								
11-CSNM-Int-241-	ics in Qua	s in Quantum Engineering											
m01	ECTS	6	Duratior		1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	S			/ (3) + R (1) Module taught in: English								
				b) ora c) ora d) pro e) pre lf a wr form c 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 form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is cha the lecturer must inform students about this by four weeks prior to the original examination date at the latest. 								
	other p			Approval from examination committee required.									
11-FK2-Int-201-m01			<u> </u>										
		8	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	S		V (4) + R (2) Module taught in: English									
	Methoo	d of ass		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 examina	ation committee require	d.						

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11-EIM-Int-201-	Electron	and lo	n Micros	сору									
m01	ECTS 6	5	Duration	1	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Courses			V (3) ·		•							
					Module taught in: English								
	Method o	ofasse	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,								
							y four weeks prior to the origin						
					lage of assessment								
					ssment offered: In th	ne semester in which	the course is offered and in the	e following seme	ester				
11-CSPM-Int-201-	Advance				1			1					
m01	ECTS 6	5	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate				
	Courses			V (3) · Modu	+ R (1) Ile taught in: English	ı							
	Method of assessment			oral e prese If a wi form o the le	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 form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment i the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: English								
	other pre	erequis	sites	Approval from examination committee required.									
11-FKS-Int-201-m01	-201-m01 Solid State Spectrocop			/	~	<u>.</u>		<u>.</u>					
	ECTS 6	5	Duration		1 semester	Method of grading	numerical grade	Modul level	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. Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: English									

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11-TEFK-Int-201-	Topolo	gical E	ffects in S	olid S	tate Physics								
m01	ECTS	8	Duratio	ı	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Courses				V (4) + R (2) Module taught in: English								
	Methoo	d of ass	sessment	oral oral oral oral oral oral oral of pressoned of the second sec	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). f 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 canguage of assessment: English								
11-FFK-Int-201-m01	Field T	heory i	n Solid Sta	ate Ph	ysics								
	ECTS	8	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	S			(4) + R (2) Nodule taught in: English								
	Method of assessment			oral oral oral oral oral oral oral of pressoned of the second sec	each (approx. 30 minutes) or c) ort (approx. 8 to 10 pages) or e) sessment may instead take the ethod of assessment is changed, date at the latest. emester								
11-AKTF-Int-201-	Selecte	ed Topi	cs of Theo	retica	l Solid State Phys	ics							
m01	ECTS	6	Duratio	ı	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	S		V (3) + R (1) Module taught in: English									
	Methoo	d of ass	sessment	oral oral oral oral of present of a with the location of the l	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											
m01	ECTS	6	Duratio	า	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	S			V (3) + R (1) Module taught in: English								
	Methoo	d of as	sessment	oral oral oral oral oral oral oral of pressoned of the second sec	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). f 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 canguage of assessment: English								
11-QM2-Int-201-	Quantu	ım Me	chanics II										
m01	ECTS	8	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	undergraduate				
	Course	S			(4) + R (2) Nodule taught in: English								
	Method	1 01 85	sessment	oral oral oral oral oral oral oral of pressoned for the location of the locati	examination in gr entation/talk (app vritten examinatic of an oral examir	each (approx. 30 minutes) or c) ort (approx. 8 to 10 pages) or e) sessment may instead take the ethod of assessment is changed, date at the latest. emester							
11-TQO-Int-221-	1- Theoretical Quantum O												
m01	ECTS	8	Duratio										
	Course	S		V (4) + R (2) Module taught in: English									
	Method	l of as	sessment	written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral ex- amination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentati- on/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	Theoret	tical So	olid State	Physic								
	ECTS	8	Duration	า	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Courses			Mod	+ R (2) ule taught in: Engl							
				oral o prese If a w form the lo Asse Lang	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-		nenolo	gy and Th	eory c	f Superconductiv	ity						
m01	ECTS	6	Duration	۱	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Courses	S			(3) + R (1) Iodule taught in: English							
			sessment	oral oral of present of a with the location of	examination in gro entation/talk (app rritten examinatio of an oral examin ecturer must inforn ssment offered: Ir uage of assessme	each (approx. 30 minutes) or c) ort (approx. 8 to 10 pages) or e) sessment may instead take the lethod of assessment is changed, date at the latest. emester						
11-QIC-Int-201-m01	Advanc	ed The	ory of Qua	ntum	Computing and C	uantum Information						
	ECTS	6	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Courses	S			+ R (1) ule taught in: Engl	ish						
	Method	d of ass	sessment	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	ed Mag	netic Res	onance	e Imaging								
m01	ECTS	6	Duratio	า	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	s		V(3) + R(1)									
		· · · ·			Module taught in: English								
				oral ex preset If a wr form o the let 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). f 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	e Scienc	e										
m01	ECTS	6	Duration	า	1 semester	Method of grading	numerical grade	Modul level	graduate				
	Course	S			V (3) + R (1) Module taught in: English								
	Method of assessment			oral ex preset If a wr form o the let Asses	xamination in group ntation/talk (approx itten examination w of an oral examinatio cturer must inform s	s (groups of 2, appro . 30 minutes). as chosen as metho on of one candidate tudents about this b e semester in which	d of assessment, this may be c	or d) project repo hanged and ass groups. If the ma al examination o	ort (approx. 8 to 10 pages) or e) essment may instead take the ethod of assessment is changed, date at the latest.				
11-FPA-Int-201-m01	Visiting	g Resea	rch										
	ECTS	10	Duration			Method of grading	numerical grade	Modul level	graduate				
	Courses			R (o) Module taught in: English									
	Method	l of asse	essment	project report (10 to 20 pages) Language of assessment: English									
	other p	rerequis	sites	Appro	val from examinatio	n committee require	d.						

11-EXP5-Int-201-	Current	t Topics	in Physic	:s								
m01	ECTS	5	Duratio	ก	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	Courses			V (2) + R (2) Module taught in: English							
	Methoc	l of ass		oral oral oral oral oral oral oral of the present of the present of the left or the left o	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	Appr	oval from examina	tion committee require	d.					
11-EXP6-Int-201-	Current	t Topics	in Physic	:s								
m01	ECTS	6	Duration	n	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Courses	S		V (3)	+ R (1)							
	other prerequisites Current Topics in Physi			If a w form the le Lang	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-EXP7-Int-201- m01		<u> </u>	· · · ·									
	ECTS Course	7 S	Duratio	1 semester Method of grading numerical grade Modul level graduate 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	Appr	oval from examination	tion committee require	d.					

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11-EXP8-Int-201-	Curren	t Topics	in Physic	s		,						
m01	ECTS	8	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S		V (4) + R (2) Module taught in: English								
	Methoo	1 of asse	essment	oral e prese If a w form o 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) oresentation/talk (approx. 30 minutes). f 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. anguage of assessment: English							
	other p	rerequi	sites	Appro	oval from examination	on committee require	d.					
11-EXP6A-Int-201-	Curren	t Topics	in Physic	:s								
m01	ECTS 6 Duratio			n	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Course	S			+ R (1) Ile taught in: English	1						
	Methoo	1 of asse	essment	oral e prese If a wi form o the le	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 min oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 p presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may inste- form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment 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 Nontechr	ical Min	ors										
10-M-VAN-222-	Advand	ced Anal	lysis									
m01	ECTS	10	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses			V (4) + Ü (2)								
	Method	1 of asse	essment	b) ora c) ora Langu	al examination of on Il examination in gro	e candidate each (15	to 15 minutes per candi					

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10-M=VDI-	Discrete Mathematics											
Min-152-m01	ECTS 5	Duratio	n	1 semester	Method of grading numerical grad	de	Modul level	graduate				
	Courses		V (3) -									
				le taught in: English								
	Method of ass	sessment			pprox. 60 to 90 minutes, usually cho			one candidate each (approx. 15				
				inutes) or c) oral examination in groups (groups of 2, approx. 10 minutes per candidate) ssessment offered: In the semester in which the course is offered and in the subsequent semester								
			Langu	anguage of assessment: English								
				able for bonus								
10-l=QC-221-m01	Quantum Com	municatio	ons									
	ECTS 5	Duratio		1 semester	Method of grading numerical grad	de	Modul level	graduate				
	Courses		V (2) ·									
				le taught in: English								
	Method of ass	sessment			rox. 60 to 120 minutes) rer at the beginning of the course, th	ha writtan ayami	nation 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 candi- date).									
			Language of assessment: English									
			creditable for bonus Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR									
	Additional Info			es available for stu	dents of the Master's programme Inf	formatik (Compu	ter Science, 120	o ECIS credits): LR				
10-I-APR-172-m01	Advanced Pro		-									
	ECTS 5	Duratio		1 semester	Method of grading numerical grad	de	Modul level	undergraduate				
	Courses		V (2) ·									
	Method of ass	sessment	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 candi-									
			date).			U U U		Cold and a second se				
			Language of assessment: German and/or English creditable for bonus									
	Databasas		credit	able for bonus								
10-I=DB-161-m01	Databases ECTS 5	Duratio			Mathad of grading humarical grad	da	Modul level	areducto				
	ECTS 5 Courses	Duratio		1 semester	Method of grading numerical grad	ue	Modul level	graduate				
	Method of ass	occmont	$V(2) + \ddot{U}(2)$									
	Method 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 cand date).									
					ation for Master's students. : German and/or English							
				able for bonus	. German anu/or Eligiish							
	Additional Info	ormation			dents of the Master's programme Inf	formatik (Compu	ter Science. 120	o ECTS credits): SE. IS. HCI. GE.				

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10-l-BS-191-m01	Operatin	perating Systems									
	ECTS 4	5	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate		
	Courses				- + Ü (2)				- -		
					le taught in: English						
	Method	ofasse	essment			rox. 60 to 120 minute		nation may be	replaced by an oral examination		
									approx. 15 minutes per candi-		
				date).			5 .				
					lage of assessment: able for bonus	: German and/or Engl	ish				
10-I=Kl1-212-m01	Artificial	Intelli	gence 1	create							
	ECTS 4		Duration	n	1 semester	Method of grading	numerical grade	Modul level	graduate		
	Courses	-		V (2) -	+ Ü (2)				, -		
	Method	ofasse	essment			rox. 60 to 120 minute					
				If ann	ounced by the lectu	rer at the beginning (of the course, the written exami	nation may be r	replaced by an oral examination 5 (approx. 15 minutes per candi-		
				date).		pprox. 20 minutes) of	an orac examination in groups		approx. 15 minutes per candi-		
				Language of assessment: German and/or English							
				creditable for bonus							
	Addition			Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT,SE,KI,HCI							
02-N-Ö- W2-05-152-m01	Environn		r								
W2-05-152-11101	ECTS 3 Duratio				1 semester	Method of grading	numerical grade	Modul level	undergraduate		
	Courses			V (2)							
	Method of assessment			a) written examination (approx. 120 minutes) or b) oral examination (approx. 15 minutes) Assessment offered: Usually every two years, winter semester							
	other pre	erequis	ites	Prior completion of the following module is recommended: 02-N-Ö-V							
11-AP-Int-201-m01	Astrophy		0								
	ECTS e	5	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate		
	Courses			V (2) + R (2)							
				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							
									ethod of assessment is changed,		
							y four weeks prior to the origina the course is offered and in the				
					lage of assessment:						

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11-ASM-Int-201-	Method	Methods of Observational Astronomy										
m01	ECTS	6	Duration	ı	1 semester	Method of grading	numerical grade	Modul level	graduate			
	Courses				+ R (1) ule taught in: Englis	h						
	Method	of asse	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-ASP-Int-201-	Introduc	tion to	Space P	hysics	5							
m01	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			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-EXZ5-Int-201-	Nontechnical Special Topics											
m01	ECTS	5	Duration		1 semester	Method of grading	numerical grade	Modul level	graduate			
	Courses			V (2) + R (2) 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 pr	erequis	sites	Appr	oval from examinat	ion committee require	d.					

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11-EXZ6-Int-201-	Nontechnical Special Topics										
m01	ECTS	6	Duration	า	1 semester	Method of grading	numerical grade	Modul level	graduate		
	Course	s		V (3) -		-		-			
					le taught in: English						
	Metho	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.							
					lage of assessment:		y lour weeks phot to the origina				
	other p	rerequi	sites			on committee require	d.				
11-EXNT6-Int-201-			Ninor Sub	ject		· · ·					
m01	ECTS	6	Duration	1	1 semester	Method of grading	numerical grade	Modul level	graduate		
	Course	S		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 prerequisites			Approval from examination committee required.							
Master Project Mo	dules (6	o ECTS o	credits)								
11-FS-N-Int-201-	Profes	sional S	pecializat	tion Qu	antum Engineering	5					
m01	ECTS	15	Duration	1	1 semester	Method of grading	(not) successfully completed	Modul level			
	Courses			S (4) Module taught in: English							
	Metho	d of ass	essment	talk with discussion (30 to 45 minutes) Language of assessment: English							
11-MP-N-Int-201-	Scienti	fic Metl	nods and	Project Management Quantum Engineering							
m01	ECTS	15	Duration		1 semester	Method of grading	(not) successfully completed	Modul level			
	Course	S		R (4) Modu	le taught in: English	1					
	Metho	d of ass	essment								

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11-MA-N-Int-201-	1- Master Thesis Quantum Engineering									
m01	ECTS	30	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	graduate	
	Courses no courses assigned Module taught in: English									
	Methoo	d of asse	essment		r's thesis (750 to 90 age of assessment:					
	Additional Information Time to complete: 6 months									

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