

Subdivided Module Catalogue for the Module studies (Master)

Quantum Technology

Examination regulations version: 2021 Responsible: Faculty of Physics and Astronomy

JMU Würzburg • generated 24-Feb-2024 • exam. reg. data record MM|k29|-|-|H|2021



Abbreviations used

Course types: $\mathbf{E} = \text{field trip}$, $\mathbf{K} = \text{colloquium}$, $\mathbf{O} = \text{conversatorium}$, $\mathbf{P} = \text{placement/lab course}$, $\mathbf{R} = \text{project}$, $\mathbf{S} = \text{seminar}$, $\mathbf{T} = \text{tutorial}$, $\ddot{\mathbf{U}} = \text{exercise}$, $\mathbf{V} = \text{lecture}$

Term: **SS** = summer semester, **WS** = winter semester

Methods of grading: **NUM** = numerical grade, **B/NB** = (not) successfully completed

Regulations: **(L)ASPO** = general academic and examination regulations (for teaching-degree programmes), **FSB** = subject-specific provisions, **SFB** = list of modules

Other: A = thesis, LV = course(s), PL = assessment(s), TN = participants, VL = prerequisite(s)

Conventions

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

Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with

the general regulations governing the degree subject described in this module catalogue:

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

15-May-2019 (2019-36)

27-Jun-2019 (2019-41)

14-Nov-2019 (2019-52)

22-Jan-2020 (2020-13)

o6-May-2020 (2020-39)

22-Jul-2020 (2020-57)

17-Dec-2020 (2020-110)

10-Mar-2021 (2021-17)



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o9-Jun-2021 (2021-58)
22-Dec-2021 (2021-85)
05-Jul-2022 (2022-52)
31-Jan-2023 (2022-86)
15-Jun-2023 (2023-58)
13-Dec-2023 (2023-107)
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This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.



The subject is divided into

Abbreviation	Module title		Method of grading	page
Winter Term 2021				
11-EXP6-161-m01	Current Topics in Physik	6	NUM	17
11-EXP6A-161-m01	Current Topics in Physik	6	NUM	18
11-EXP5-161-m01	Current Topics in Physik	5	NUM	16
11-EXP7-161-m01	Current Topics in Physik	7	NUM	19
11-EXP8-161-m01	Current Topics in Physik	8	NUM	20
11-EXN5-212-m01	Current Topics in Quantum Technology	5	NUM	11
11-EXN6-212-m01	Current Topics in Quantum Technology	6	NUM	12
11-EXN7-212-m01	Current Topics in Quantum Technology	7	NUM	14
11-EXN8-212-m01	Current Topics in Quantum Technology	8	NUM	15
11-EXN6A-212-m01	Current Topics in Quantum Technology	6	NUM	13
11-CSFM-161-m01	Advanced Topics in Solid State Physics	6	NUM	8
11-CSPM-161-m01	Advanced Topics in Physics	6	NUM	10
11-CSNM-212-m01	Advanced Topics in Quantum Technology	6	NUM	9
Summer Term 2022		•	•	•
11-EXP6-161-m01	Current Topics in Physik	6	NUM	17
11-EXP6A-161-m01	Current Topics in Physik	6	NUM	18
11-EXP5-161-m01	Current Topics in Physik	5	NUM	16
11-EXP7-161-m01	Current Topics in Physik	7	NUM	19
11-EXP8-161-m01	Current Topics in Physik	8	NUM	20
11-EXN5-212-m01	Current Topics in Quantum Technology	5	NUM	11
11-EXN6-212-m01	Current Topics in Quantum Technology	6	NUM	12
11-EXN7-212-m01	Current Topics in Quantum Technology	7	NUM	14
11-EXN8-212-m01	Current Topics in Quantum Technology	8	NUM	15
11-EXN6A-212-m01	Current Topics in Quantum Technology	6	NUM	13
11-CSFM-161-m01	Advanced Topics in Solid State Physics	6	NUM	8
11-CSPM-161-m01	Advanced Topics in Physics	6	NUM	10
11-CSNM-212-m01	Advanced Topics in Quantum Technology	6	NUM	9
Winter Term 2022		,		-
11-EXP6-161-m01	Current Topics in Physik	6	NUM	17
11-EXP6A-161-m01	Current Topics in Physik	6	NUM	18
11-EXP5-161-m01	Current Topics in Physik	5	NUM	16
11-EXP7-161-m01	Current Topics in Physik	7	NUM	19
11-EXP8-161-m01	Current Topics in Physik	8	NUM	20
11-EXN5-212-m01	Current Topics in Quantum Technology	5	NUM	11
11-EXN6-212-m01	Current Topics in Quantum Technology	6	NUM	12
11-EXN7-212-m01	Current Topics in Quantum Technology	7	NUM	14
11-EXN8-212-m01	Current Topics in Quantum Technology	8	NUM	15
11-EXN6A-212-m01	Current Topics in Quantum Technology	6	NUM	13
11-CSFM-161-m01	Advanced Topics in Solid State Physics	6	NUM	8
11-CSPM-161-m01	Advanced Topics in Physics	6	NUM	10
11-CSNM-212-m01	Advanced Topics in Quantum Technology	6	NUM	9



Summer Term 2023				
11-CSEM6-152-m01	Selected Topics in Energy and Material Science	6	NUM	6
11-CSF6-152-m01	Selected Topics in Solid State Physics	6	NUM	7
11-CSFM-161-m01	Advanced Topics in Solid State Physics	6	NUM	8
11-CSNM-212-m01	Advanced Topics in Quantum Technology	6	NUM	9
11-CSPM-161-m01	Advanced Topics in Physics	6	NUM	10
11-EXN5-212-m01	Current Topics in Quantum Technology	5	NUM	11
11-EXN6-212-m01	Current Topics in Quantum Technology	6	NUM	12
11-EXN6A-212-m01	Current Topics in Quantum Technology	6	NUM	13
11-EXN7-212-m01	Current Topics in Quantum Technology	7	NUM	14
11-EXN8-212-m01	Current Topics in Quantum Technology	8	NUM	15
11-EXP5-161-m01	Current Topics in Physik	5	NUM	16
11-EXP6-161-m01	Current Topics in Physik	6	NUM	17
11-EXP8-161-m01	Current Topics in Physik	8	NUM	20
Winter Term 2022	•	•	•	
11-EXP6-161-m01	Current Topics in Physik	6	NUM	17
11-EXP5-161-m01	Current Topics in Physik	5	NUM	16
11-EXP8-161-m01	Current Topics in Physik	8	NUM	20
11-EXN5-212-m01	Current Topics in Quantum Technology	5	NUM	11
11-EXN6-212-m01	Current Topics in Quantum Technology	6	NUM	12
11-EXN7-212-m01	Current Topics in Quantum Technology	7	NUM	14
11-EXN8-212-m01	Current Topics in Quantum Technology	8	NUM	15
11-EXN6A-212-m01	Current Topics in Quantum Technology	6	NUM	13
11-CSEM6-152-m01	Selected Topics in Energy and Material Science	6	NUM	6
11-CSF6-152-m01	Selected Topics in Solid State Physics	6	NUM	7
11-CSFM-161-mo1	Advanced Topics in Solid State Physics	6	NUM	8
11-CSPM-161-m01	Advanced Topics in Physics	6	NUM	10
11-CSNM-212-m01	Advanced Topics in Quantum Technology	6	NUM	9
Summer Term 2024		-		-
11-EXP6-161-m01	Current Topics in Physik	6	NUM	17
11-EXP5-161-m01	Current Topics in Physik	5	NUM	16
11-EXP8-161-m01	Current Topics in Physik	8	NUM	20
11-EXN5-212-m01	Current Topics in Quantum Technology	5	NUM	11
11-EXN6-212-m01	Current Topics in Quantum Technology	6	NUM	12
11-EXN7-212-m01	Current Topics in Quantum Technology	7	NUM	14
11-EXN8-212-m01	Current Topics in Quantum Technology	8	NUM	15
11-EXN6A-212-m01	Current Topics in Quantum Technology	6	NUM	13
11-CSEM6-152-m01	Selected Topics in Energy and Material Science	6	NUM	6
11-CSF6-152-m01	Selected Topics in Solid State Physics	6	NUM	7
11-CSFM-161-m01	Advanced Topics in Solid State Physics	6	NUM	8
11-CSPM-161-m01	Advanced Topics in Physics	6	NUM	10
11-CSNM-212-m01	Advanced Topics in Quantum Technology	6	NUM	9



Modul	e title	,			Abbreviation
Selecto	ed Topi	cs in Energy and Materia	l Science		11-CSEM6-152-m01
Module	e coord	inator		Module offered by	
chairperson of examination committee			Faculty of Physics a	and Astronomy	
ECTS		od of grading	Only after succ. con		and Astronomy
6		rical grade		,	
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate	Approval from exam	ination committee r	equired.
Conter	ıts				
Selecte	ed topic	s of energy and material	s research.		
Intend	ed learı	ning outcomes			
tion me	The students have basic knowledge of energy and material research and understand the measuring and evaluation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.				
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	ın)
V (3) +	R (1)				
	Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)				
or oral pages) If a wri stead t of asse nation	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. Language of assessment: German and/or English				
Allocat	tion of p	olaces			
Additio	onal inf	ormation			
	_				
Worklo	ad				
180 h					
Teachi	ng cycl	<u> </u>			
Referre	ed to in	LPO I (examination regu	lations for teaching-	degree programmes)	
				· · · · · · · · · · · · · · · · · · ·	



Modul	Module title Abbreviation				
Selecto	ed Topi	cs in Solid State Physics			11-CSF6-152-m01
Module	e coord	inator		Module offered by	
	chairperson of examination committee			Faculty of Physics a	and Astronomy
ECTS		od of grading	Only after succ. con		and Astronomy
6		rical grade		ipti oi modute(s)	
Duratio		Module level	Other prerequisites		
1 seme		undergraduate		ination committee r	equired.
Conter	nts				
Selecte	ed topio	s of Solid-State Physics.			
		ning outcomes			
and ev	The students have basic knowledge of a specialist field of Solid-State Physics and understand the measuring and evaluation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.				
Course	es (type	, number of weekly conta	ct hours, language –	- if other than Germa	ın)
V (3) +	R (1)				
		sessment (type, scope, la ion on whether module c			ntion offered — if not every seme-
or oral pages) If a wri stead t of asse nation	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. Language of assessment: German and/or English				
Allocat	tion of p	places			
			,		
Additio	onal inf	ormation			
Worklo	oad				
180 h	,				
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regu	lations for teaching-o	degree programmes)	



	Module title Abbreviation				
Advanc	ed Top	oics in Solid State Physic	S		11-CSFM-161-m01
Module	e coord	linator		Module offered by	
Manag and As	_	ector of the Institute of Th sics	neoretical Physics	Faculty of Physics a	and Astronomy
ECTS	ECTS Method of grading Only after succ. compl. of module(s)				
6	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	graduate	Approval from exam	ination committee r	equired.
Conten	its				
vered i not inc	n any c luded i	of the other modules. The n the regular curriculum.			anced courses on topics not co- arch developments or to subjects
Intend	ed lear	ning outcomes			
		advance their knowledge nsights into the connectio			of Condensed Matter Physics
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	an)
V (3) +	R (1)		_		
	Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)				
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: German and/or English					
Allocat	ion of	places			
Additio	nal inf	ormation			
Worklo	ad				
180 h					
Teachi	ng cycl	e			



Modul	e title				Abbreviation	
Advan	Advanced Topics in Quantum Technology 11-CSNM-212-m01					
Modul	Module coordinator			Module offered by		
Manag	ging Dir	ector of the Institute of Th	neoretical Physics	Faculty of Physics a	and Astronomy	
and As	strophy		Ť			
		Only after succ. cor	npl. of module(s)			
6		rical grade				
Durati		Module level	Other prerequisites			
1 seme	ester	graduate	Approval from exan	nination committee r	equired.	
Conte	nts		•			
					ve lectures on advanced topics	
		e covered by any other m cs that are not included i			new developments in research or	
		ning outcomes	- Trine regular teaching	ig cycle.		
			and understanding o	of an advanced topic	in quantum technology, thereby	
		nts into the interface betw			q	
Course	es (type	, number of weekly conta	act hours, language -	– if other than Germa	an)	
V (3) +	R (1)					
Modul	e taugh	t in: German or English				
		sessment (type, scope, la ion on whether module c			ation offered — if not every seme-	
or oral pages) If a wri stead of asso nation	examine examine executed execute execu	nation in groups (groups sentation/talk (approx. 3 amination was chosen as e form of an oral examina	of 2, approx. 30 minutes). Is method of assessmution of one candidate The must inform studen	utes per candidate) o ent, this may be cha e each or an oral exa	didate each (approx. 30 minutes) or project report (approx. 8 to 10 nged and assessment may inmination in groups. If the method weeks prior to the original exami-	
Alloca	tion of	places				
Additi	onal inf	ormation				
Workl	oad					
180 h			_			
Teachi	ing cycl	e				



Contents This module will enable lecturers of Physics to teach advanced course modules. These topics may relate either to recent research developm lar curriculum. Intended learning outcomes The students advance their knowledge and understanding of an adva acquire insights into the connections between research and teaching. Courses (type, number of weekly contact hours, language — if other to V (3) + R (1) Method of assessment (type, scope, language — if other than German ster, information on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination or oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this method of assessment is changed, the lecturer must inform students about the nation date at the latest.	Abbreviation
chairperson of examination committee Faculty of ECTS Method of grading Only after succ. compl. of mo 6 numerical grade Duration Module level Other prerequisites	11-CSPM-161-mo1
Method of grading 6 numerical grade Duration Module level Other prerequisites 1 semester graduate Approval from examination concents This module will enable lecturers of Physics to teach advanced course modules. These topics may relate either to recent research developmentar curriculum. Intended learning outcomes The students advance their knowledge and understanding of an advance quire insights into the connections between research and teaching Courses (type, number of weekly contact hours, language — if other towns of assessment (type, scope, language — if other than German ster, information on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination or oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this method take the form of an oral examination of one candidate each or a of assessment is changed, the lecturer must inform students about the nation date at the latest.	offered by
Duration Module level Other prerequisites 1 semester graduate Approval from examination composed of the semester of Physics to teach advanced course modules. These topics may relate either to recent research developmolar curriculum. Intended learning outcomes The students advance their knowledge and understanding of an advance insights into the connections between research and teaching Courses (type, number of weekly contact hours, language — if other to the topic of the sement on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination or oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this method that the latest.	f Physics and Astronomy
Duration Module level Approval from examination compared to the semester graduate Approval from examination compared to the semester graduate Approval from examination compared to the semester Approval from examination compared to the semester Approval from examination compared to the semination of the semination of the semination of the students advance their knowledge and understanding of an advance understanding of an advance their knowledge and understanding of an advance transplant into the connections between research and teaching Courses (type, number of weekly contact hours, language — if other the semination on whether module can be chosen to earn a bonus) Wethod of assessment (type, scope, language — if other than Germanster, information on whether module can be chosen to earn a bonus) Written examination (approx. 90 to 120 minutes) or oral examination or oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this material take the form of an oral examination of one candidate each or a for assessment is changed, the lecturer must inform students about the nation date at the latest.	dule(s)
Contents This module will enable lecturers of Physics to teach advanced course modules. These topics may relate either to recent research developm lar curriculum. Intended learning outcomes The students advance their knowledge and understanding of an advance insights into the connections between research and teaching Courses (type, number of weekly contact hours, language — if other to V(3) + R(1) Method of assessment (type, scope, language — if other than German ster, information on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination for oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this material take the form of an oral examination of one candidate each or a for assessment is changed, the lecturer must inform students about the nation date at the latest.	
This module will enable lecturers of Physics to teach advanced course modules. These topics may relate either to recent research developm lar curriculum. Intended learning outcomes The students advance their knowledge and understanding of an advance insights into the connections between research and teaching Courses (type, number of weekly contact hours, language — if other to the total examination on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination for oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this material take the form of an oral examination of one candidate each or a for assessment is changed, the lecturer must inform students about the nation date at the latest.	
This module will enable lecturers of Physics to teach advanced course modules. These topics may relate either to recent research developm lar curriculum. Intended learning outcomes The students advance their knowledge and understanding of an advance insights into the connections between research and teaching courses (type, number of weekly contact hours, language — if other to the total of assessment (type, scope, language — if other than German ster, information on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination for oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this method take the form of an oral examination of one candidate each or a for assessment is changed, the lecturer must inform students about the nation date at the latest.	ommittee required.
Intended learning outcomes The students advance their knowledge and understanding of an advance insights into the connections between research and teaching (Courses (type, number of weekly contact hours, language — if other to (3) + R (1) Method of assessment (type, scope, language — if other than Germanster, information on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination for oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this material take the form of an oral examination of one candidate each or a for assessment is changed, the lecturer must inform students about the nation date at the latest.	
Courses (type, number of weekly contact hours, language — if other to (1/3) + R (1) Method of assessment (type, scope, language — if other than German ster, information on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination for oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this material take the form of an oral examination of one candidate each or a for assessment is changed, the lecturer must inform students about the nation date at the latest.	nced topic of nanostructure technology and
Method of assessment (type, scope, language — if other than German ster, information on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination or oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this material take the form of an oral examination of one candidate each or a for assessment is changed, the lecturer must inform students about the nation date at the latest.	
Method of assessment (type, scope, language — if other than Germanster, information on whether module can be chosen to earn a bonus) written examination (approx. 90 to 120 minutes) or oral examination for oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this material take the form of an oral examination of one candidate each or a for assessment is changed, the lecturer must inform students about the nation date at the latest.	han German)
written examination (approx. 90 to 120 minutes) or oral examination or oral examination (approx. 90 to 120 minutes) or oral examination for oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this material take the form of an oral examination of one candidate each or a for assessment is changed, the lecturer must inform students about the nation date at the latest.	
or oral examination in groups (groups of 2, approx. 30 minutes per capages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this method take the form of an oral examination of one candidate each or a coff assessment is changed, the lecturer must inform students about the nation date at the latest.	n, examination offered — if not every seme-
	ndidate) or project report (approx. 8 to 10 nay be changed and assessment may inan oral examination in groups. If the metho
Allocation of places	

Additional information

Workload

180 h

Teaching cycle



		186,17	5 (6 2 3 3 6) 8	33 8 19	
Module	e title	,			Abbreviation
Curren	Current Topics in Quantum Technology				11-EXN5-212-m01
Module	e coord	inator		Module offered by	
chairpe	erson o	f examination committee		Faculty of Physics a	and Astronomy
ECTS		od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate	Approval from exam	ination committee r	equired.
Conten	ts				
		in experimental or theor tudy abroad.	etical physics. Credit	ed academic achiev	ements, e.g. in case of change of
Intend	ed lear	ning outcomes			
physics rent fie knowle	The student posseses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.				
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	ın)
V (2) + Module		t in: German or English			
		sessment (type, scope, la ion on whether module c			ation offered — if not every seme-
or oral pages) If a wri- stead t of asse nation	examir or pres tten exa ake the essmen date at	nation in groups (groups of sentation/talk (approx. 30 amination was chosen as the form of an oral examina	of 2, approx. 30 minu o minutes). o method of assessmo tion of one candidate o must inform student	tes per candidate) o ent, this may be cha e each or an oral exa	didate each (approx. 30 minutes) or project report (approx. 8 to 10 nged and assessment may inmination in groups. If the method weeks prior to the original exami-
Allocat	ion of	olaces			
Additio	nal inf	ormation			
Worklo	ad				
150 h					
Teachi	na cycl	Δ			
TEACIII	ig cycl	C			



	Module title Abbreviation					
Curren	t Topic	s in Quantum Technolog	gy		11-EXN6-212-m01	
Modul	e coord	linator		Module offered b	y	
chairpe	erson o	of examination committe	e	Faculty of Physics	and Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
6	nume	erical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate	Approval from exam	ination committee	required.	
Conter	its					
univers	sity or s	s in experimental or theo study abroad. rning outcomes	oretical physics. Credit	ed academic achie	evements, e.g. in case of change o	
The stuphysicates the street the	ident p s on Ma eld in p	osseses advanced knov aster's level in the study hysics and insight into t	programme Quantum he measuring and cald	Technology. He/S culating methods v	odule in theoretical or experimenta he commands knowledge in a cur- which are necessary to acquire this out fields of application.	
Course	s (type	, number of weekly cont	tact hours, language –	- if other than Gern	nan)	
V (3) + Modul		nt in: German or English				
		sessment (type, scope, ion on whether module			nation offered — if not every seme	
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.

Language of assessment: German and/or English
Allocation of places
Additional information
Workload
180 h
Teaching cycle



Wi	ÜRZBU	JRG T	5 (3 3 3 6) 8	33 0 2 6	Quantum Technology	
Module	title				Abbreviation	
Current	Current Topics in Quantum Technology 11-EXN6A-212-m01					
Module	Module coordinator Module offered by					
chairpe	erson o	f examination committee	!	Faculty of Physics a	and Astronomy	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
6	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i		
1 seme	ster	graduate	Approval from exam	ination committee r	equired.	
Conten	ts					
I	•	in experimental or theor tudy abroad.	etical physics. Credit	ed academic achiev	ements, e.g. in case of change of	
Intende	ed lear	ning outcomes				
physics rent fie	on Ma ld in pl	aster's level in the study p	orogramme Quantum e measuring and calo	Technology. He/Shoculating methods wh	lule in theoretical or experimental e commands knowledge in a cur- nich are necessary to acquire this ut fields of application.	
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	an)	
	V (3) + R (1) Module taught in: German or English					
		sessment (type, scope, la ion on whether module ca			ation offered — if not every seme-	
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.						
	of assessment is changed, the lecturer must inform students about this by four weeks prior to the original exami					

nation date at the latest.

Language of assessment: German and/or English

Allocation of places
Additional information

Workload

180 h

Teaching cycle



	(TAN A 12 M MOAN O 2 N. C. N.						
Module	Module title Abbreviation						
Current	t Topic	s in Quantum Technology		11-EXN7-212-m01			
Module	e coord	inator		Module offered by			
chairpe	erson o	f examination committee		Faculty of Physics a	and Astronomy		
ECTS		od of grading	Only after succ. con	npl. of module(s)			
7	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate	Approval from exam	ination committee r	equired.		
Conten	ts						
		in experimental or theor tudy abroad.	etical physics. Credit	ed academic achiev	ements, e.g. in case of change of		
Intende	ed lear	ning outcomes					
physics rent fie knowle	s on Ma ld in pl edge. H	aster's level in the study prysics and insight into the e/She is able to classify a	orogramme Quantum e measuring and calo and to link the learnt.	Technology. He/She culating methods wh He/She knows abou	· · · · · · · · · · · · · · · · · · ·		
		, number of weekly conta	<u>ict hours, language –</u>	- if other than Germa	in)		
V (3) + Module		t in: German or English					
		sessment (type, scope, la ion on whether module c			ition offered — if not every seme-		
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. Language of assessment: German and/or English							
Allocation of places							
							
Additio	nal inf	ormation					
Worklo	Workload						
210 h							
i e							

Teaching cycle



	ÜRZBU		5 (A. S. A.	3 9 2 9	Quantum Technology		
Module title Abbreviation							
		s in Quantum Technology	y		11-EXN8-212-mo1		
Module		inator		Module offered by			
		f examination committee		†	and Astronomy		
ECTS		od of grading	Only after succ. con	Faculty of Physics a	and Astronomy		
8		rical grade		ipt. or modute(3)			
Duratio		Module level	Other prerequisites				
1 seme	ster	graduate	Approval from exam		equired.		
Conten	ts						
		in experimental or theor tudy abroad.	retical physics. Credit	ed academic achiev	ements, e.g. in case of change of		
Intende	ed lear	ning outcomes					
physics rent fie	s on Ma Id in pl	aster's level in the study _I	programme Quantum e measuring and cald	Technology. He/Shoculating methods wh	ule in theoretical or experimental e commands knowledge in a cur- nich are necessary to acquire this ut fields of application.		
Course	s (type	, number of weekly conta	act hours, language –	- if other than Germa	an)		
V (4) + R (2) Module taught in: German or English							
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)							
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.							

nation date at the latest.

Language of assessment: German and/or English

Allocation of places	
Additional information	
Workload	

Teaching cycle

240 h



Module title					Abbreviation
Current Topics in Physik				-	11-EXP5-161-m01
Modul	e coord	inator		Module offered by	
chairpe	erson o	f examination committe	ee	Faculty of Physics	and Astronomy
ECTS	Metho	od of grading	Only after succ. con		
5	nume	rical grade			
Duratio	on	Module level	Other prerequisites	;	
1 seme	ester	graduate	Approval from exam	nination committee i	required.
Conter	nts				
		in Experimental or The tudy abroad.	oretical Physics. Credi	ted academic achiev	vements, e.g. in case of change of
Intend	ed learı	ning outcomes			
knowle Course	edge. Thes (type	of Physics and underst ney are able to classify , number of weekly con	the subject-specific co	ntexts and know the	
V (2) +	R (2)				
		sessment (type, scope, on on whether module			ation offered — if not every seme-
or oral pages) If a wristead to fassenation	examin or pres tten exa take the essmen date at	ation in groups (groups sentation/talk (approx. amination was chosen a form of an oral examir	s of 2, approx. 30 minu 30 minutes). as method of assessm ation of one candidate er must inform student	ites per candidate) of ent, this may be cha e each or an oral exa	ndidate each (approx. 30 minutes) or project report (approx. 8 to 10 anged and assessment may inamination in groups. If the method weeks prior to the original exami-
Langua	age oi a	SSESSINEIR. German an	u/ OI LIIBUSII		
	tion of p		u/or English		

Additional information

Workload

1<u>5</u>0 h

Teaching cycle



Modul	e title				Abbreviation		
Current Topics in Physik				-	11-EXP6-161-m01		
Modul	e coord	linator		Module offered by			
chairpe	erson o	f examination commit	tee	Faculty of Physics and Astronomy			
ECTS	Meth	od of grading	Only after succ. cor	Only after succ. compl. of module(s)			
6	nume	rical grade					
Duratio	n	Module level	Other prerequisites	sites			
1 seme	ster	graduate	Approval from exam	pproval from examination committee required.			
Contents							
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.							
Intended learning outcomes							

The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

 $\textbf{Courses} \ (\textbf{type}, \textbf{number of weekly contact hours, language} - \textbf{if other than German})$

V(3) + R(1)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

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: German and/or English

Allocation of places

Additional information

Workload

180 h

Teaching cycle



Module title Abbreviation							
Current Topics in Physik					11-EXP6A-161-m01		
Module coordinator				Module offe	red by		
chairpe	erson o	f examination comr	nittee	Faculty of Ph	nysics and Astronomy		
ECTS	Meth	od of grading	Only after su	icc. compl. of module	e(s)		
6	nume	rical grade					
Duratio	n	Module level	Other prerec	uisites			
1 seme	ster	graduate	Approval fro	Approval from examination committee required.			
Conten	ts						
		s in Experimental or study abroad.	Theoretical Physics	. Credited academic	achievements, e.g. in case of change of		
Intende	ed lear	ning outcomes					
The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.							
Courses (type, number of weekly contact hours, language — if other than German)							
V (3) + R (1)							
		sessment (type, sco			xamination offered — if not every seme		
a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 mi-							

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: German and/or English

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Additional information

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Workload

180 h

Teaching cycle

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

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	Module title Abbreviation						
Curren	t Topic	s in Physik			11-EXP7-161-m01		
Module	e coord	inator		Module offered by			
chairpe	erson o	f examination committee	!	Faculty of Physics a	and Astronomy		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
7	nume	rical grade	grade				
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate	Approval from exam	ination committee r	equired.		
Conten	ts						
		of Experimental and The versity or study abroad.	oretical Physics. Acc	redited academic ac	chievements, e.g. in case of		
Intend	ed lear	ning outcomes					
Theore subdis	tical Ph cipline	ysics of the Master's pro	gramme of Nanostruend the measuring and	cture Technology. Th d/or calculation met	of a module of Experimental or ney have knowledge of a current shods necessary to acquire this e application areas.		
Course	s (type	, number of weekly conta	ct hours, language –	- if other than Germa	an)		
V (3) +	R (1)						
		sessment (type, scope, la ion on whether module c			ation offered — if not every seme-		
or oral pages) If a writ stead t of asse nation	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. Language of assessment: German and/or English						
Allocation of places							
Additio	nal inf	ormation					
Worklo	ad						
210 h							

Teaching cycle



Modul				Abbreviation			
Curren	t Topic	s in Physik			11-EXP8-161-m01		
Modul	e coord	inator		Module offered by			
chairp	erson o	f examination committee		Faculty of Physics a	and Astronomy		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
8	nume	rical grade					
Duration	on	Module level	Other prerequisites				
1 seme	ster	graduate	Approval from exam	ination committee r	equired.		
Conter	ıts						
1	•	of Experimental and The versity or study abroad.	oretical Physics. Acc	redited academic ac	chievements, e.g. in case of		
Intend	ed lear	ning outcomes					
subdis knowle	cipline edge. Th	of Physics and understaney are able to classify th	nd the measuring and e subject-specific co	d/or calculation met ntexts and know the	_ · ·		
		, number of weekly conta	ct hours, language –	- if other than Germa	an)		
V (4) +							
		sessment (type, scope, la ion on whether module c			ation offered — if not every seme-		
or oral pages) If a wri stead t of asse nation	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. Language of assessment: German and/or English						
Allocat	Allocation of places						
Additio	Additional information						
Worklo	ad						
240 h	-						
'							

Teaching cycle