

## **Annex SFB**

## Studienfachbeschreibung (subject description, SFB) for the subject Mathematical Physics as a Bachelor's with 1 major with the degree "Bachelor of Science" (180 ECTS credits)

Responsible: Faculty of Mathematics and Computer Science

Responsible: Institute of Mathematics

Responsible: Faculty of Physics and Astronomy

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

= lecture

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

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

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

= list of modules

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

Conventions for the

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not cre-

modules in this SFB: ditable for bonus.

Information on Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the meassessment procedures: 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

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.

Examination regulations version: 2020

Examination regulations version: 2020

Examination regulations version: 2020

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

## ASP02015

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

22-Jan-2020 (2020-6)

??-???-2024 (2024-??)

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	ecified in the form X	(y) with course type ?	Cabbreviated as specified abo	ve and number of we	ekly contact hours y			
	Method of as	ssessme	ent								
	Only after su completion o		l if applica	ble							
	Other prereq	uisites	if applica	if applicable							
	Participants and allocation of places		ocati- if applica	if applicable							
	Additional information		on if applica	if applicable							
	Referred to in LPO I		if applica	if applicable (examination regulations for teaching-degree programmes)							

<b>Compulsory Course</b>	es (104 E	CTS cre	dits)								
Subfield Analysis (	25 ECTS	credits	)								
10-M-ANP-Ü-202-	Overvi	ew Anal	ysis for N	lathem	atical Physics						
mo1	ECTS 16 Duration			n	2 semester	Method of grading	numerical grade	Modul level	undergraduate		
	Course	S		V (4) -	+ V (4) + Ü (2)						
	Method of assessment			Asses	oral examination of one candidate each (20 to 40 minutes) Assessment will have reference to the contents of modules 10-M-ANAP1 and 10-M-ANAP2. Language of assessment: German and/or English						
10-M-VAN-202-	Advanc	ed Anal	lysis								
mo1	ECTS	CTS 9 Duratio		n	1 semester	Method of grading	numerical grade	Modul level	undergraduate		
	Course	S		V (4) -	+ Ü (2)						
	Method	d of asso	essment	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) creditable for bonus Language of assessment: German and/or English							
Subfield Linear Alg	ebra (16	ECTS c	redits)								
10-M-LNP-Ü-202-	Overvi	ew Linea	ar Algebra	a for M	athematical Physics						
mo1	ECTS 16 Duration		Duratio	n	2 semester	Method of grading	numerical grade	Modul level	undergraduate		
	Courses			$V(4) + V(4) + \ddot{U}(2)$							
	Method of assessmen				oral examination of one candidate each (20 to 40 minutes) Assessment will have reference to the contents of modules 10-M-LNAP1 and 10-M-LNP-Ü. Language of assessment: German and/or English						

<b>Subfield Classical</b>	Physics (16 EC	TS credits)											
11-E-M-152-m01	Classical Phy	/sics 1 (Me	chanic	s)									
	ECTS 8	Duratio	n	1 semester	Method of grading numerical gr	ade	Modul level	undergraduate					
	Courses	•		$(4) + \ddot{U}(2)$									
				ıle taught in: Ü: Ger									
	Method of as	sessment		written examination (approx. 120 minutes) Language of assessment: German and/or English									
	other prerequ	uisites	succe	Admission prerequisite to assessment: completion of exercises (approx. 13 exercise sheets per semester). Students who successfully completed approx. 50% of exercises will qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the semester.									
	Additional In	formation	consi neral the q stude for ar sessr	Registration: If a student registers for the exercises and obtains the qualification for admission to assessment, this will be considered a declaration of will to seek admission to assessment pursuant to Section 20 Subsection 3 Sentence 4 ASPO (general academic and examination regulations). If the module coordinators subsequently find that the student has obtained the qualification for admission to assessment, they will put the student's registration for assessment into effect. Only those students that meet the respective prerequisites can successfully register for an assessment. Students who did not register for an assessment or whose registration for an assessment was not put into effect will not be admitted to the respective assessment. If a student takes an assessment to which he/she has not been admitted, the grade achieved in this assessment will not be considered.									
	Referred to ir	LPO I	§ 53 l § 77 l	Nr. 1 a) Nr. 1 a)									
11-E-E-152-m01	Classical Physics 2 (Heat and Electromagnetism)												
	ECTS 8	Duratio	n										
	Courses		V (4) Modu	V (4) + Ü (2) Module taught in: Ü: German or English									
	Method of as	sessment	written examination (approx. 120 minutes) Language of assessment: German and/or English										
	other prerequ	uisites	Admission prerequisite to assessment: completion of exercises (approx. 13 exercise sheets per semester). Students who successfully completed approx. 50% of exercises will qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the semester.										
	Additional In		Registration: If a student registers for the exercises and obtains the qualification for admission to assessment, this will be considered a declaration of will to seek admission to assessment pursuant to Section 20 Subsection 3 Sentence 4 ASPO (general academic and examination regulations). If the module coordinators subsequently find that the student has obtained the qualification for admission to assessment, they will put the student's registration for assessment into effect. Only those students that meet the respective prerequisites can successfully register for an assessment. Students who did not register for an assessment or whose registration for an assessment was not put into effect will not be admitted to the respective assessment. If a student takes an assessment to which he/she has not been admitted, the grade achieved in this assessment will not be considered.										
	Referred to ir	n LPO I	§ 53 l § 77 l	Nr. 1 a) Nr. 1 a)			_						

11-T-M-152-m01	Theore	etical M	echanics										
-	ECTS	8	Duratio	n	1 semester	Method of grading   numerical grade	Modul level	undergraduate					
	Course	es			V (4) + Ü (2) Module taught in: Ü: German or English								
	Metho	d of ass	essment	writte	written examination (approx. 120 minutes) Language of assessment: German and/or English								
	other p	prerequi	sites	succe	essfully completed	to assessment: completion of exercises (appraprox. 50% of exercises will qualify for admitals at the beginning of the semester.							
	Addition	onal Info	ormation	consi neral the q stude for ar sessr	Registration: If a student registers for the exercises and obtains the qualification for admission to assessment, this will be considered a declaration of will to seek admission to assessment pursuant to Section 20 Subsection 3 Sentence 4 ASPO (ge neral academic and examination regulations). If the module coordinators subsequently find that the student has obtained the qualification for admission to assessment, they will put the student's registration for assessment into effect. Only those students that meet the respective prerequisites can successfully register for an assessment. Students who did not register for an assessment or whose registration for an assessment was not put into effect will not be admitted to the respective assessment. If a student takes an assessment to which he/she has not been admitted, the grade achieved in this assessment will not be considered.								
11-T-Q-152-m01	Quantum Mechanics												
	ECTS	8	Duratio	n	- Common of Grands   March of								
	Course	es		V (4) + Ü (2) Module taught in: Ü: German or English									
	Metho	d of ass	essment	written examination (approx. 120 minutes) Language of assessment: German and/or English									
	other prerequisites			Admission prerequisite to assessment: completion of exercises (approx. 13 exercise sheets per semester). Students who successfully completed approx. 50% of exercises will qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the semester.									
	Addition	onal Info	ormation	consi neral the q stude for ar sessr	dered a declaratio academic and exa ualification for adnents that meet the inassessment or wh	It registers for the exercises and obtains the q n of will to seek admission to assessment pur imination regulations). If the module coordina mission to assessment, they will put the stude respective prerequisites can successfully reginose registration for an assessment was not p akes an assessment to which he/she has not	rsuant to Section 20 Sul stors subsequently find ent's registration for ass ster for an assessment. out into effect will not be	bsection 3 Sentence 4 ASPO (gethat the student has obtained tessment into effect. Only those Students who did not register admitted to the respective as-					

Subfield Statistica	l Physics	and El	ectrodyna	amics (:	16 ECTS credits)						
11-T-SE-152-m01	Statisti	ical Phy	sics and	Electro	dynamics						
	ECTS	6	Duration	n	2 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S		V (4) +	- V (4)						
	Method	d of asso	essment			candidate each (approx. 30 minutes) t: German and/or English		-			
11-T-SA-152-m01	Statisti	ical Phy	sics - Exe	rcises							
	ECTS	5	Duration	n	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S		Ü (2) Modu	(2) odule taught in: Ü: German or English						
	Method	of asso	of assessment written examination (approx. 120 minutes) Language of assessment: German and/or English								
11-T-EA-152-m01	Electro	dynami	cs - Exerc	ises							
	ECTS 5 Duratio		n	1 semester	Method of grading   numerical grade	Modul level	undergraduate				
	Course	S		Ü (2) Module taught in: Ü: German or English							
	Method	d of asso	essment	written examination (approx. 120 minutes) Language of assessment: German and/or English							
Subfield Laborator	y Course	Physic	s (15 ECT:	S credit	ts)						
11-P-PA-152-m01	Labora	tory Co	urse Phys	ics A (N	Mechanics, Heat, I	Electromagnetism)					
	ECTS	3	Duration	n	1 semester	Method of grading (not) successfully complete	ed Modul level	undergraduate			
	Course	S	-	P (2)			-				
	Method of assessment			practical assignment with talk (approx. 30 minutes)  Preparing, performing and evaluating (record of readings or lab report) the experiments will be considered successfully completed if a Testat (exam) is passed. Exactly one experiment that was not successfully completed can be repeated once. After completion of all experiments, talk (with discussion; approx. 30 minutes) to test the candidate's understanding of the physics-related contents of the module. Talks that were not successfully completed can be repeated once. Both components of the assessment have to be successfully completed.							

11-P-FR1-152-m01	Data and Error Analysis												
	ECTS	2	Duration	1	1 semester	Method of grading	(not) successfully	y completed	Modul level	undergraduate			
	Courses	5		V (1) + Ü (1) Module taught in: Ü: German or English									
	Method	l of ass	essment		itten examination (approx. 120 minutes) nguage of assessment: German and/or English mission prerequisite to assessment: completion of exercises (approx. 13 exercise sheets per semester). Students who ccessfully completed approx. 50% of exercises will qualify for admission to assessment. The lecturer will inform students out the respective details at the beginning of the semester.								
	other pr	rerequi	sites	succe									
				consideral at the questuder for an sessmith not a sessmith to the constant of	lered a declaration academic and exan alification for adm nts that meet the reassessment or who ent. If a student taut be considered.	of will to seek admis nination regulations) ission to assessmen espective prerequisit ose registration for a	ssion to assessmer . If the module coo t, they will put the sees can successfully n assessment was	nt pursuant to ordinators sub student's regi y register for a not put into e	Section 20 Subsequently find the stration for assum assessment.	on to assessment, this will be osection 3 Sentence 4 ASPO (gethat the student has obtained essment into effect. Only those Students who did not register admitted to the respective asde achieved in this assessment			
	Referred	d to in I		§ 53 I § 77 I	Nr. 1 c) Nr. 1 d)								
11-P-MPB-152-m01													
	ECTS	4	Duration		Method of grading (not) successfully completed   Modul level   undergraduate								
	Courses	S		P (2)									
				Prepar pleted compl sics-re the as	practical assignment with talk (approx. 30 minutes) Preparing, performing and evaluating (record of readings or lab report) the experiments will be considered successfully completed if a Testat (exam) is passed. Exactly one experiment that was not successfully completed can be repeated once. After completion of all experiments, talk (with discussion; approx. 30 minutes) to test the candidate's understanding of the physics-related contents of the module. Talks that were not successfully completed can be repeated once. Both components of the assessment have to be successfully completed.								
	other pr					· · · · · · · · · · · · · · · · · · ·	te modules 11-P-PA	and 11-P-FR1	prior to comple	ting module 11-P-MPB.			
11-P-MPC-152-m01		tory Co			r Students of Math	<u> </u>	_						
	ECTS	4	Duration			Method of grading	(not) successfully	y completed	Modul level	undergraduate			
	Courses			P (2)									
				practical assignment with talk (approx. 30 minutes)  Preparing, performing and evaluating (record of readings or lab report) the experiments will be considered successfully completed if a Testat (exam) is passed. Exactly one experiment that was not successfully completed can be repeated once. After completion of all experiments, talk (with discussion; approx. 30 minutes) to test the candidate's understanding of the physics-related contents of the module. Talks that were not successfully completed can be repeated once. Both components of the assessment have to be successfully completed.									
	other pr	rerequi	sites	Stude	nts are highly recor	mmended to complet	te module 11-P-MPI	B prior to com	pleting module	11-P-MPC.			

11-P-FR2-152-m01	Advance	Advanced and Computational Data Analysis												
	ECTS	2	Duration	า	1 semester	Method of grading (not) successfully co	mpleted	Modul level	undergraduate					
	Courses		,	V (1) +	- Ü (1)									
	Method	of asse	essment			npletion of approx. 50% of approx. 10 exer	cise shee	ts)						
						e a year, summer semester								
	other pr			Students are highly recommended to complete module 11-P-FR1 prior to completing module 11-P-FR2.										
Compulsory Elective					<u> </u>									
<b>Subgroup Basics o</b>	f Mathem	atical	Methods	(5 ECT	S credits)									
10-M-ANAP1-202-	Analysis	s 1 for <i>N</i>	<b>Nathema</b> t	tical Pl	nysics									
mo1	ECTS 5 Duratio				1 semester	Method of grading (not) successfully co	mpleted	Modul level	undergraduate					
	Courses			Ü (2)										
	Method	of asse	essment	written examination (approx. 90 to 180 minutes) and written exercises (approx. 12 exercise sheets with approx. 4 exercises each) Language of assessment: German and/or English										
10-M-ANAP2-202-	Analysis	s 2 for l	Mathematical Physics											
mo1	ECTS	5	Duration	1	1 semester	Method of grading (not) successfully co	mpleted	Modul level	undergraduate					
	Courses			Ü (2)										
	Method of assessment			written examination (approx. 90 to 180 minutes) and written exercises (approx. 12 exercise sheets with approx. 4 exercises each) Language of assessment: German and/or English										
Subfield Lineare Al	gebra (5 l	ECTS cı	redits)											
10-M-LNAP1-202-	Linear A	lgebra	1 for Mat	hemat	ical Physics									
mo1	ECTS	5	Duration	1	1 semester	Method of grading (not) successfully co	mpleted	Modul level	undergraduate					
	Courses		•	Ü (2)										
	Method	of asse	essment	each)		rox. 90 to 180 minutes) and written exercis : German and/or English	ses (appro	ox. 12 exercise s	sheets with approx. 4 exercises					
10-M-LNAP2-202-	Linear A	lgebra	2 for Mat	themat	ical Physics									
mo1	ECTS	5	Duration		1 semester	Method of grading (not) successfully co	mpleted	Modul level	undergraduate					
	Courses			Ü (2)										
	Method of assessment			written examination (approx. 90 to 180 minutes) and written exercises (approx. 12 exercise sheets with approx. 4 exercises each) Language of assessment: German and/or English										

Mathematical Met	hods (18	ECTS cı	redits)									
Subgroup Basics o	f Mathem	natical	Methods	(5 ECT	S credits)							
10-M-DGE-202-	Introdu	ction to	Differen	tial Ge	ial Geometry							
mo1	ECTS	5	Duratio	n	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate			
	Courses	5		V (4)	+ Ü (2)							
				b) ora c) ora credi Lang Asse	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) creditable for bonus Language of assessment: German and/or English Assessment offered: In the semester in which the course is offered and in the subsequent semester							
10-M-DGL-202-	Ordinar	y Diffe	rential Eq	uatior	s			'				
mo1	ECTS	5	Duratio	n	1 semester	Method of grading	(not) successfully completed	d Modul level	undergraduate			
	Courses				+ Ü (2)			•				
AS MITTLESS WAS				b) ora c) ora credi Lang	itten examination (ap al examination of one al examination in gro table for bonus uage of assessment:							
10-M-FTH-202-m01	-		Duration		1	Mathada fawadina	(n a t) a a a fi . ll a m n l a t a .	l Madulland	Lunda verra du aka			
		5	Duratio		1 semester	Method of grading	(not) successfully completed	d Modul level	undergraduate			
		of asso		V (4) + Ü (2)  a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) creditable for bonus Language of assessment: German and/or English								
10-M-GAN-202-	Geomet	ric Ana	lysis									
mo1	ECTS	5	Duratio		1 semester	Method of grading	(not) successfully completed	d Modul level	undergraduate			
	Courses		,	` ' '	+ Ü (2)							
	Method of assessment			b) ora c) ora credi	al examination of one al examination in gro table for bonus	e candidate each (15	to 15 minutes per candidate)					

10-M-FAN-202-	Introduction to Functional Analysis												
mo1	ECTS	5	Duration	n	1 semester	Method of grading (not) successfully completed	Modul level	undergraduate					
	Course	S	•	V (4) +	+ Ü (2)								
	Method	d of asso	essment	b) ora c) ora credit	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) creditable for bonus Language of assessment: German and/or English								
10-M-PAR-202-	Introdu	ction to	Partial D	ifferen	itial Equations		,						
mo1	ECTS	5	Duration	1	1 semester	Method of grading (not) successfully completed	Modul level	undergraduate					
	Courses			V (4) -	+ Ü (2)								
	Method	d of asse	essment	b) ora c) ora credit Langu	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) creditable for bonus Language of assessment: German and/or English Assessment offered: In the semester in which the course is offered and in the subsequent semester								
<b>Subfield Overview</b>	Mathem	atical N	lethods (:	13 ECTS	S credits)								
10-M-DGGD-	Overview Differential Geometry and Ordinary Differential Equations for Mathematical Physics												
PÜ-152-mo1	ECTS	13	Duration	n	1 semester	Method of grading numerical grade	Modul level	undergraduate					
	Course	S	_	V (4) +	+ Ü (2)								
	Method	d of asso	essment	Asses select cal Me	sment will have refe ted as the subject of ethods) or in modul	andidate each (20 to 40 minutes) erence to two topics in pure mathematics as agreed f one examination in the sub-field Gesamtüberblick e group Ergänzung Mathematik (Supplementary Top e German and/or English	Mathematische	Methoden (Overview Mathemati-					
	Overvie	w Com	plex Anal	ysis an	d Differential Geom	etry for Mathematical Physics							
mo1	ECTS	13	Duration	1	1 semester	Method of grading   numerical grade	Modul level	undergraduate					
	Course	s		V (4) +	V (4) + Ü (2)								
	Method	d of asso	essment	Asses select cal Me	sment will have refe ted as the subject of ethods) or in modul	andidate each (20 to 40 minutes) erence to two topics in pure mathematics as agreed f one examination in the sub-field Gesamtüberblick e group Ergänzung Mathematik (Supplementary Top German and/or English	Mathematische	Methoden (Overview Mathemati-					

10-M-FTGD-PÜ-152-	Overvie	w Com	plex Anal	is and Ordinary Differential Equations for Mathematical Physics									
mo1	ECTS	13	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate						
	Courses	S		V (4) + Ü (2)		•							
	Method	of ass	essment	oral examination of one candidate each (20 to 40 minutes)									
				Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathemati-									
					l Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). nguage of assessment: German and/or English								
10-M-GADG-	Overvie	ew Geor	netric Ana		Geometry for Mathematical Physics								
PÜ-152-m01		13	Duration	<u> </u>	Method of grading   numerical grade	Modul level	undergraduate						
	Courses	S		V (4) + Ü (2)									
	Method	d of ass	essment	Assessment will have selected as the subjected as the subject cal Methods) or in mo	ral examination of one candidate each (20 to 40 minutes) ssessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be elected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematial Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). anguage of assessment: German and/or English								
10-M-GAGD-	Overvie	w Geor	metric Ana	llysis and Ordinary Dif	ferential Equations for Mathematical Physics								
PÜ-152-m01	ECTS	13	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate						
	Courses	S		V (4) + Ü (2)									
				selected as the subject cal Methods) or in mo	Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematical Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics).  Language of assessment: German and/or English								
_	Overvie	w Geor	metric Ana	llysis and Complex Ana	alysis for Mathematical Physics								
mo1	ECTS	13	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate						
	Courses	S		V (4) + Ü (2)									
	Method of assessment			oral examination of one candidate each (20 to 40 minutes) Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Maccal Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). Language of assessment: German and/or English									
10-M-FADG-	Overvie	w Func	tional Ana	alysis and Differential	Geometry for Mathematical Physics								
PÜ-152-mo1	ECTS	13	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate						
	Courses	S		V (4) + Ü (2)									
	Method of assessment			Assessment will have selected as the subjected as the subject cal Methods) or in mo	ne candidate each (20 to 40 minutes) reference to two topics in pure mathematics as a to of one examination in the sub-field Gesamtüber dule group Ergänzung Mathematik (Supplementa ent: German and/or English	rblick Mathematische	e Methoden (Overview Mathemati-						

10-M-FAGD-	Overvie	Overview Functional Analysis and Ordinary Differential Equations for Mathematical Physics												
PÜ-152-m01	ECTS	13	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate					
	Courses	S	•	V (4)	+ Ü (2)			•						
	Method	of ass	essment		oral examination of one candidate each (20 to 40 minutes)									
					Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be									
					selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematical Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics).									
					cal Methods) or in module group Erganzung Mathematik (Supplementary Topics in Mathematics).  Language of assessment: German and/or English									
10-M-FΔFT-PÜ-152-	Overvie	Overview Functional Analysis and Complex Analysis for Mathematical Physics												
mo1		13	Duration		1 semester	Method of grading		Modul level	undergraduate					
			Duration		+ Ü (2)	Method of grading	Humerical grade	Modul level	undergraduate					
	Courses					andidate each (20 to	(a minutas)							
	Method	i or ass	essment					l unon with the	examiner. Each topic may only be					
									e Methoden (Overview Mathemati-					
				cal M	ethods) or in module	e group Ergänzung M	athematik (Supplementary To							
				Langı	nguage of assessment: German and/or English									
10-M-FA-	Overvie	w Func	tional An	alysis	sis and Geometric Analysis for Mathematical Physics									
GA-PÜ-152-m01	ECTS	13	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate					
	Courses	S		V (4)	+ Ü (2)									
	Method	of ass	essment			andidate each (20 to								
				Asses	ssment will have refe	erence to two topics i	n pure mathematics as agreed	l upon with the	examiner. Each topic may only be					
					selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematical Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics).									
					Language of assessment: German and/or English									
10-M-DG-	Overview Differential Geometry and Partial Differential Equations for Mathematical Physics													
PA-PÜ-152-mo1		13	Duration		1 semester	Method of grading		Modul level	undergraduate					
	Courses		2 4. 4		+ Ü (2)	method or grading	mameneat grade							
			essment			andidate each (20 to	40 minutes)							
	Method	101 433	CSSIIICIIC	Asses	oral examination of one candidate each (20 to 40 minutes) Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be									
				selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathemat										
				cal Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics).										
						German and/or Eng			,					
10-M-GD-		w Ordi			l Equations and Part		tions for Mathematical Physic	s						
PA-PÜ-152-m01	ECTS	13	Duratio		1 semester	Method of grading	numerical grade	Modul level	undergraduate					
	Courses	S		V (4) + Ü (2)										
	Method	of ass	essment		oral examination of one candidate each (20 to 40 minutes)									
				Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be										
				selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematical Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics).										
						e group Erganzung M German and/or Eng		pics in <i>i</i> viatnema	atics).					
				Lange	ממבר טו מסטכסטווופווני	German and/or Engl		-						

10-M-FTPA-PÜ-152-	Overview Complex Analysis and Partial Differential Equations for Mathematical Physics												
mo1	ECTS	13	Duration	1	1 semester	Method of grading	numerical grade	Modul level	undergraduate				
	Course	S		V (4) +	$(4) + \ddot{U}(2)$								
	Method	d of asse	essment	Asses select cal Me	ral examination of one candidate each (20 to 40 minutes) ssessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be elected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathemati- al Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). anguage of assessment: German and/or English								
10-M-GA-	Overvie	w Geon	netric Ana	alysis a	and Partial Differen	tial Equations for Ma	thematical Physics						
PA-PÜ-152-m01	ECTS	13	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	undergraduate				
	Course	S	•	V (4) +	+ Ü (2)								
M 500 50				Asses select cal Me Langu	oral examination of one candidate each (20 to 40 minutes) Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematical Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). Language of assessment: German and/or English								
10-M-FAPA-PÜ-152-													
mo1		13	Duratio		1 semester	Method of grading	numerical grade	Modul level	undergraduate				
	Courses			V (4) +									
	Method	d of asse	essment	oral examination of one candidate each (20 to 40 minutes) Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may or selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematik) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). Language of assessment: German and/or English									
Mathematical Phys	ics (18 E	CTS cre	edits)										
Module Group Supp	olement	ary Top	ics in Ma	hemat	ics								
10-M-NUM1P-152-	Numeri	cal Mat	hematics	1 for N	Nathematical Physi	ics							
mo1	ECTS	10	Duration	า	1 semester	Method of grading	numerical grade	Modul level	undergraduate				
	Course	S	,	V (4) -	V (4) + Ü (2)								
	Method of assessment			a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus									

10-M-NUM2P-152-	Numeri	ical Mat	thematics	2 for	Mathematical Phy	sics						
mo1	ECTS	10	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	S		V (4)	+ Ü (2)			·				
	Method	d of ass	essment	nutes Lang	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate)  Language of assessment: German and/or English creditable for bonus							
10-M-STO1P-152-	Stocha	Stochastics 1 for Mathematical Physics										
mo1	ECTS	10	Duratio	า	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	S		V (4)	+ Ü (2)			,				
	Method of assessment			nutes Lang credi	written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 mi- utes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) anguage of assessment: German and/or English reditable for bonus							
10-M-STO2P-152-	Stocha	stics 2	for Mathe	matic	atical Physics							
mo1	ECTS 10 Duratio				1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses				+ Ü (2)							
	Method of assessment			nutes Lang	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate)  Language of assessment: German and/or English creditable for bonus							
10-M-ALGP-152-	Introduction to Algebra for Mathematical Physics											
mo1	ECTS	10	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	S	•	V (4) + Ü (2)								
	Method	d of ass	essment	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate)  Language of assessment: German and/or English creditable for bonus								
10-M-DIMP-152-	Introdu	ction to	o Discrete	Math	ematics for Mathe	matical Physics		'				
mo1	ECTS	10	Duratio	า	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	S		V (4)	+ Ü (2)			•				
	Method	d of ass	essment	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 nutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus					f one candidate each (15 to 30 mi-			

10-M-PGEP-152-	Introdu	ction to	Projecti	ve Geo	metry for Mathema	tical Physics	1	1			
mo1	ECTS	10	Duratio	n	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	Courses			+ Ü (2)		,				
	Method	d of ass	essment	nutes Asses Langu	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: German and/or English Creditable for bonus						
10-M-ZTHP-152-	Introdu	ction to	Number	Theory	for Mathematical	Physics					
mo1	ECTS	10	Duratio	1	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S		V (4) ·	+ Ü (2)						
	Method	d of ass	essment	nutes Langu	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate)  Language of assessment: German and/or English creditable for bonus						
10-M-OR-	Operations Research for Mathematical Physics										
SP-152-m01	ECTS 10 Duratio			n	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Courses			V (4) ·	+ Ü (2)						
	Method of assessment			nutes Asses Langu	) or c) oral examina ssment offered: In t	approx. 90 to 180 minutes, usually chosen) tion in groups (groups of 2, 10 to 15 minut he semester in which the course is offered are English	es per candidate)				
10-M-DGEP-152-	Introdu	ction to	Differen	tial Ge	ometry for Mathem	atical Physics					
mo1	ECTS	10	Duratio	1	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S	,	V (4) + Ü (2)							
	Method	d of ass	essment	a) oral examination of one candidate each (15 to 30 minutes) or b) oral examination in groups of 2 candidates (10 to 15 minutes each)  Assessment will have reference to a topic in pure mathematics as agreed upon with the examiner. Each topic may only be selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematical Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics).  Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: German and/or English creditable for bonus							

10-M-DGLP-152-	Ordinary Differential Equations for Mathematical Physics											
mo1	ECTS 1	10	Duration		1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses			V (4) +	(4) + Ü (2)							
	Method	of asses	ssment	tes ea Assess lected Metho Langu	oral examination of one candidate each (15 to 30 minutes) or b) oral examination in groups of 2 candidates (10 to 15 minutes each) ssessment will have reference to a topic in pure mathematics as agreed upon with the examiner. Each topic may only be sected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematical lethods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). anguage of assessment: German and/or English reditable for bonus							
10-M-FT-	Introduc	tion to C	Complex	k Analy	sis for Mathematica	al Physics						
HP-152-m01	ECTS 1	10	Duration	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses			V (4) +	- Ü (2)							
AA GANIB	Method			tes ea Asses lected Metho Langu credita	a) oral examination of one candidate each (15 to 30 minutes) or b) oral examination in groups of 2 candidates (10 to 15 minutes) or b) oral examination in groups of 2 candidates (10 to 15 minutes) or b) oral examination in groups of 2 candidates (10 to 15 minutes) or b) or an interest of the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathemat Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics).  Language of assessment: German and/or English or bonus							
10-M-GANP-152-		<u>·</u>			natical Physics							
mo1	ECTS 1	10	Duration		1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses				V (4) + Ü (2) a) oral examination of one candidate each (15 to 30 minutes) or b) oral examination in groups of 2 candidates (10 to 15 minu-							
	Method of assessment			tes ea Assess lected Metho Langu	ch) sment will have refe as the subject of o ods) or in module gr	erence to a topic in po ne examination in the	ure mathematics as a e sub-field Gesamtüb ematik (Supplementa	greed upon with the exa	miner. Each topic may only be se- Methoden (Overview Mathematical			
10-M-FANP-152-	Introduc	tion to F	unction	ial Anal	lysis for Mathemati	cal Physics						
mo1	ECTS 1	10	Duration	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses			V (4) +	- Ü (2)							
	Method of assessment			tes ea Assess lected Metho Langu	ch) sment will have refe as the subject of o ods) or in module gr	on of one candidate each (15 to 30 minutes) or b) oral examination in groups of 2 candidates (10 to 15 minutes) ave reference to a topic in pure mathematics as agreed upon with the examiner. Each topic may only be ect of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematics) and the group Ergänzung Mathematik (Supplementary Topics in Mathematics).  Sissiment: German and/or English us						

10-M-PARP-152-	Introduction to Partial Differential Equations for Mathematical Physics										
mo1	ECTS	10	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Course	S		V (4) + Ü (2)		·					
	Method	d of ass	essment	oral examination of one candidate each (15 to 30 minutes) or b) oral examination in groups of 2 candidates (10 to 15 minues each) Assessment will have reference to a topic in pure mathematics as agreed upon with the examiner. Each topic may only be se-							
				Methods) or in modul Assessment offered:	ated as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematica ethods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). sessment offered: In the semester in which the course is offered and in the subsequent semester nguage of assessment: German and/or English editable for bonus						
10-M-MWR-152-	Modeli	ng and	Computat	ional Science	'	'					
mo1	ECTS	8	Duration	1 semester	Method of grading   numerical grade	Modul level	undergraduate				
	Course	S		V (4) + Ü (2) Module taught in: Ge	/ (4) + Ü (2) Module taught in: German and/or English						
	Method of assessment			a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 mi- nutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English Creditable for bonus							
Module Group Exp	perimenta	al Physi	cs								
11-E-O-152-m01	Optics	and Wa	ves								
	ECTS 8 Duratio				Method of grading   numerical grade	Modul level	undergraduate				
	Courses			V (4) + Ü (2) Module taught in: Ü: German or English							
	Method of assessment			written examination (approx. 120 minutes) Language of assessment: German and/or English							
11-E-A-152-m01	Atoms	and Qu	anta			'					
	ECTS	8	Duration		Method of grading   numerical grade	Modul level	undergraduate				
	Course	S		V (4) + Ü (2) Module taught in: Ü: German or English							
	Method	d of ass	essment	written examination (approx. 120 minutes) Language of assessment: German and/or English							
11-E-F-152-m01	Introdu	iction to	Solid Sta	te Physics		,					
	ECTS	8	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Courses			V (4) + Ü (2) Module taught in: Ü: German or English							
	Method	d of ass	essment	written examination (approx. 120 minutes) Language of assessment: German and/or English							

11-E-T-152-m01	Nuclear and Elementary Particle Physics										
	ECTS	6	Duratio	ı	1 semester	Method of grading numerical grad	de	Modul level	undergraduate		
	Course	S		V (3) +				-			
		,		Module taught in: Ü: German or English							
	Method	d of ass	essment		vritten examination (approx. 120 minutes) Language of assessment: German and/or English						
Module Group Sup	plement	ary Top	ics in Phy	sics							
11-RRF-202-m01	Introdu	iction to	Relativis	tic Phy	sics and Classical	Field Theory					
	ECTS	6	Duratio	า	1 semester	Method of grading numerical grad	de	Modul level	undergraduate		
	Course	S		V (3) +	R (1) le taught in: Germar	n or English		^			
	Methox	2 01 033	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.  Language of assessment: German and/or English Assessment offered: Once a year, summer semester							
11-QUI-202-m01	Introdu	iction to	Quantur	m Computing and Quantum Information							
	ECTS	6	Duration	1	1 semester	Method of grading   numerical grad	de	Modul level	undergraduate		
	Course	S		V (3) + Modu	- R (1) le taught in: Germai	n or English					
	Method	d of ass	essment	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Language of assessment: German and/or English  Assessment offered: In the semester in which the course is offered and in the subsequent semester							

11-GRT-152-m01	Group Theory											
	ECTS	6	Duration	n	1 semester	Method of grading numerical grade		Modul level	graduate			
	Course	·S		V (2) - Modu	+ R (2) le taught in: Germa	n or English						
	Method	d of ass	essment	amina on/ta If a wi form o the le	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							
11-QFT1B-202-m01	Quantı	ım Field	Theory I									
	ECTS 8 Duration			1	1 semester	Method of grading numerical grade		Modul level	graduate			
	Courses				/ (4) + R (2) Module taught in: German or English							
	Method of assessment			oral e prese If a wi form o the le Langu	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minuted oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 page or							
11-CP-152-m01	Compu	tationa	l Physics									
	ECTS	6	Duration	1	1 semester	Method of grading   numerical grade		Modul level	undergraduate			
	Course	·S		V (3) + R (1) Module taught in: German or English								
	Method of assessment			written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: Once a year, winter semester Language of assessment: German and/or English								

11-SDC-152-m01	Statistics, Data Analysis and Computer Physics											
	ECTS	4	Duration	n 1 semester	Method of grading numerical grade	Modul level	graduate					
	Course	S		V (2) + R (1) Module taught in: Ger	V (2) + R (1) Module taught in: German or English							
	Method	d of ass	essment	amination in groups ( on/talk (approx. 30 m If a written examination form of an oral examination the lecturer must info Assessment offered:	ritten examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral exmination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).  a written examination was chosen as method of assessment, this may be changed and assessment may instead take the orm of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, he lecturer must inform students about this by four weeks prior to the original examination date at the latest.  ssessment offered: Once a year, winter semester anguage of assessment: German and/or English							
11-AP-152-m01	Astrop	hysics				,						
	ECTS	6	Duration	n 1 semester	Method of grading numerical grade	Modul level	undergraduate					
	Course	S		V (2) + R (2) Module taught in: Ger								
	Referred to in LPO I			oral examination in gray presentation/talk (ap If a written examination form of an oral examination the lecturer must info	a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 m oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 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 assessments are 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							
				§ 22    Nr. 1 h) § 22    Nr. 2 f) § 22    Nr. 3 f)	§ 22    Nr. 2 f)							
11-TPS-152-m01	Particle	e Physic	s (Standa	ard Model)								
	ECTS	8	Duration		Method of grading   numerical grade	Modul level	undergraduate					
	Course	S		V (4) + R (2) Module taught in: German or English								
	Method of assessment			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 presenta 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 chan 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								

11-RTTB-232-m01	Theory of Relativity											
	ECTS	6	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	S			V (3) + R (1) Module taught in: German or English  a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c)							
				oral e prese If a w form the le Langu Asses	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  Assessment offered: In the semester in which the course is offered and in the following semester							
	Additio	nal Info	rmation	Appro	oval from examinat	ion committee require	d					
<b>Module Group Curre</b>	ent Topi	ics in M	athematic	cal Phy	/sics							
11-BXMP5-152-m01	or   Current Topics in Mathematical Physics											
	ECTS	5	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	S		V (2)	+ R (2)	•			-			
	Method	1 of ass	essment	amina on/ta If a w form of the le	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							
	other p	rerequi	sites	Appro	oval from examinat	ion committee require	d.					
11-BXMP6-152-	Curren	t Topics	in Mathe	matica	al Physics			,				
mo1	ECTS	6	Duration	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	S		V (3) ·	+ R (1)							
				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								
	other p	rerequi	sites	Appro	oval from examinat	ion committee require	d.					

11-BXMP8-152-	Current	t Topics	in Mathe	matica	ıl Physics						
mo1	ECTS	8	Duratio		1 semester	Method of grading   numerical grade	Modul level	undergraduate			
	Course	S		V (4) -	+ R (2)	·	•				
	Method	Method of assessment			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						
	other p	rerequi	sites	Appro	val from examina	tion committee required.					
Key Skills Area (20	ECTS cr	edits)									
General Key Skills In addition to the r				dents r	nay also take mod	dules offered by JMU as part of the pool of general	transferable skills	(ASQ).			
General Key Skills	(subject	-specifi	ic)								
10-M-Tu-	Exercis	Exercise tutor or proof-reading in Mathematics									
Ko-152-mo1	ECTS 5 Duration			1	1 semester	Method of grading (not) successfully comple	ted Modul level	undergraduate			
	Course	Courses		T (o)							
	Method	Method of assessment			sment of tutoring x. 5 pieces of cor	activities or correcting work by supervising lectur recting work)	ers or exercise supe	ervisors (1 to 2 teaching units or			
	Additio	nal Info	rmation	Please direct application to teaching coordinator Mathematics, he/she will select participants.							
	Referre	Referred to in LPO I		§ 22    Nr. 3 f)							
10-M-VHB1-152-	E-Learr	ing an	d Blended	Learn	ing Mathematics	1					
mo1	ECTS	2	Duratio		1 semester	Method of grading (not) successfully comple	ted   Modul level	undergraduate			
	Course	Courses		Ü (2) Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)							
	Method	Method of assessment			project (web-based, 15 to 20 hours) Assessment offered: Once a year, winter semester						
10-M-VHB2-152-	E-Learr	ing an	d Blended	Learn	ing Mathematics	2					
mo1	ECTS	2	Duratio								
	Course	Courses			Ü (2) Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)						
	Method of assessment			project (web-based, 15 to 20 hours) Assessment offered: Once a year, summer semester							

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11-P-VKM-202-mo:					1	·				
		3	Duratio		1 semester	Method of grading (not) successfully completed   Modul level   undergraduate				
	Courses	5		V (1) + Modu	- Ü (2) le taught in: Germa	man or English				
	Method	of ass	essment		a) exercises (successful completion of approx. 50% of approx. 6 exercise sheets) or b) talk (approx. 15 minutes) Assessment offered: Once a year, winter semester					
	Referred			§ 22   § 22	l Nr. 1 h) l Nr. 2 f) l Nr. 3 f)					
Subject-specific K		• •								
Compulsory Cours			•							
10-M-GBM-152-	Basic N	otions	and Meth	ods of	Mathematical Rea					
mo1	ECTS	2	Duratio	1	1 semester	Method of grading (not) successfully completed   Modul level   undergraduate				
	Courses			V (1) +	_ ` ` `					
	Method	of ass	essment		project (10 to 15 pages) Language of assessment: German and/or English					
	Addition	nal Info	rmation	Addit	onal information o	n on module duration: block taught prior to the beginning of the lecture period.				
	Referred to in LPO I				l Nr. 1 h) l Nr. 2 f)					
10-M-ASM-152-	Reasoning and Writing in Mathematics									
mo1	ECTS				1 semester	Method of grading (not) successfully completed   Modul level   undergraduate				
	Courses	5		V (1) +	V (1) + Ü (1)					
	Method	Method of assessment			project (10 to 20 pages) Language of assessment: German and/or English					
11-SMP-162-m01	Semina	r Math	ematical I	Physic	5					
	ECTS	5	Duration	1	1 semester	Method of grading (not) successfully completed   Modul level   undergraduate				
	Courses	5		S (2) Modu	le taught in: Germa	man or English				
	Method	of ass	essment		o to 120 minutes) age of assessmen	es) ent: German and/or English				
Subject-specific K	ey Skills,	Compu	ılsory Ele	ctives (	(6 ECTS credits)					
10-M-SEM2-152-	Supple	mentar	y Semina	r Math	ematics					
mo1		4	Duration		1 semester	Method of grading (not) successfully completed   Modul level   undergraduate				
	Courses	•		S (2)	L					
	Method of assessment									
						ent: German and/or English				

11-HS-152-m01	Seminar Experimental/Theoretical Physics											
	ECTS	5	Duration	1	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses	5	•	S (2)								
					Module taught in: German or English							
					alk with discussion (30 to 45 minutes)							
	other pr	•		Admission prerequisite to assessment: regular attendance (minimum 85% of sessions).  Registration: If a student registers for the exercises and obtains the qualification for admission to assessment, this will be								
	Addition	nal Info	rmation	consi neral the qu stude for an sessn	considered a declaration of will to seek admission to assessment pursuant to Section 20 Subsection 3 Sentence 4 ASPO (general academic and examination regulations). If the module coordinators subsequently find that the student has obtained the qualification for admission to assessment, they will put the student's registration for assessment into effect. Only those students that meet the respective prerequisites can successfully register for an assessment. Students who did not register for an assessment or whose registration for an assessment was not put into effect will not be admitted to the respective assessment. If a student takes an assessment to which he/she has not been admitted, the grade achieved in this assessment will not be considered.							
10-M-TOP-152-m01	Introdu	ction to	Topolog	y								
	ECTS	5	Duration	1	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate			
	Courses	5		V (2) ·	(2) + Ü (2)							
	Method	l of asse	essment	nutes Asses Langu	a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: German and/or English creditable for bonus							
10-M-COM-152-	Comput	tational	Mathem	atics								
mo1	ECTS	4	Duration	1	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate			
	Courses	5		V (1) +	⊦ Ü (2)							
	Method	l of asse	essment	Asses	project in the form of programming exercises (approx. 20 to 25 hours) Assessment offered: Once a year, winter semester Language of assessment: German and/or English							
	Referred	d to in L	PO I	§ 22 l	Nr. 3 f)							
10-M-PRG-152-m01	Progran	nming o	course for	stude	nts of Mathemati	cs and other subjects						
	ECTS	3	Duration	1	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate			
	Courses	5		P (2)		,						
	Method of assessment  Referred to in LPO I			project in the form of programming exercises (approx. 20 to 25 hours) Assessment offered: Once a year, summer semester Language of assessment: German and/or English								
				§ 22 l	l Nr. 3 f)							

10-M-GES-152-m01	-GES-152-mo1 Selected Topics in History of Mathematics										
	ECTS 5	Duratio	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate				
	Courses		V (2) + Ü (2)	/ (2) + Ü (2)							
	Method o	f assessment	a) talk (45 to 90 minutes) or b) term paper (10 to 15 pages) or c) project (15 to 25 hours) Assessment offered: In the semester in which the course is offered and in the subsequent semester Language of assessment: German and/or English								
	Referred t	to in LPO I	22 II Nr. 3 f)								
10-M-MSC-152-	Mathema	tical Writing									
mo1	ECTS 5	Duratio	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate				
	Courses		V (2) + Ü (2)								
	Method o	of assessment	Assessment offered:	ites) or b) term paper (10 In the semester in which nent: German and/or Eng	to 15 pages) or c) project (15 to the course is offered and in the lish	25 hours) e subsequent so	emester				
	Referred t	to in LPO I	§ 22 II Nr. 3 f)								
10-M-SCH-152-m01	School M	athematics fro	m a Higher Perspectiv	re							
	ECTS 5	Duratio	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate				
	Courses		V (2) + Ü (2)								
	Method o	f assessment	Assessment offered:		10 to 15 pages) or c) project (15 the course is offered and in the lish		emester				
	Referred t	to in LPO I	§ 22    Nr. 1 h) § 22    Nr. 2 f) § 22    Nr. 3 f)								
10-M-PRO-152-m01	Prosemin	ar Mathematic	S								
	ECTS 4	Duration	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate				
	Courses	·	S (2)	·							
	Method o	f assessment		es) In the semester in which nent: German and/or Eng							
11-M-MR-202-m01	Mathema	tical Methods	of Physics								
	ECTS 6	Duration			(not) successfully completed	Modul level	undergraduate				
	Courses		V (2) + Ü (2) + V (2) + Module taught in: Ge								
	Method o	of assessment	Exercises (successfu Talk (approx. 15 minu		o% of approx. 13 exercise shee	ts) or					
	Referred t	to in LPO I	§ 53   Nr. 1 a) § 77   Nr. 1 a)								

11-CP-152-m01	Computational Physics								
	ECTS 6 Duration		1	1 semester	Method of grading	numerical grade	Modul level	undergraduate	
				V (3) + R (1)					
				Module taught in: German or English					
Thesis (10 ECTS cre	Method of assessment		written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).  If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.  Assessment offered: Once a year, winter semester Language of assessment: German and/or English						
10-M-BAP-152-mo1 Bachelor Thesis Mathematical Physics									
	ECTS 10 Duratio		1	1 semester	Method of grading	numerical grade	Modul level	undergraduate	
	Courses			No courses assigned to module					
	Method of assessment			written thesis (approx. 250 to 300 hours total)					
	other prerequisites			Where applicable, topic-specific modules as specified by supervisor.					
	Additional Information			Time to complete: 10 weeks.					