

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

Examination regulations version: 2016

Examination regulations version: 2016

Examination regulations version: 2016

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.

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)):

27-Jul-2016 (2016-91)

12-Jun-2024 (2024-74)

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 sp	be specified in the form X (y) with course type X abbreviated as specified above and number of weekly contact hours y							
	Method of as	ssessme	ent								
	Only after su completion o		l if applica	able							
	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	n LPO I	if applica	able (examination re	egulations for teachin	g-degree programmes)					

Compulsory Course	es (110 EC	CTS cred	dits)									
Subfield Analysis ((27 ECTS	credits)										
10-M-ANA1-152-	Analysi	S 1										
mo1	ECTS	8	Duratio	n 1 semester Method of grading (not) successfully completed		Modul level	undergraduate					
	Courses	5		V (4) -	$V(4) + \ddot{U}(2)$							
	Method	of asse	essment	each)	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-ANP-Ü-152-	Overvie	w Analy	sis for N	athem	atical Physics							
mo1	ECTS 12 Duration			1	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses	5		V (4) -	+ Ü (2)							
	Method	of asse	essment	Asses	oral examination of one candidate each (20 to 40 minutes) Assessment will have reference to the contents of modules 10-M-ANA-1 and 10-M-ANP-Ü. Language of assessment: German and/or English							
10-M-VAN-152-m01	Advance	ed Anal	ysis		•			•				
	ECTS	7	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses	5		V (4) -	+ Ü (2)							
	Method	of asse	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								
Subfield Linear Alg	gebra (20	ECTS cı	redits)									
10-M-LNA1-152-	Linear A	Algebra	1									
mo1	ECTS	8	Duration	1	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate			
	Courses	5		V (4) -	+ Ü (2)	•		•	•			
	Method	of asse	essment	each)	written examination (approx. 90 to 180 minutes) and written exercises (approx. 12 exercise sheets with approx. 4 exercises							
10-M-LNP-Ü-152-	Overvie	w Linea	r Algebra	for M	athematical Physic	S						
mo1	ECTS	12	Duratio	1	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses	5	•	V (4) -	+ Ü (2)	•						
				Asses	oral examination of one candidate each (20 to 40 minutes) Assessment will have reference to the contents of modules 10-M-LNA-1 and 10-M-LNP-Ü. Language of assessment: German and/or English							

Subfield Classical	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) + Ü (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	essfully completed a	o assessment: completion of exerc approx. 50% of exercises will qualif ails at the beginning of the semeste	y for admission to							
	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	1 semester	Method of grading numerical gr	ade	Modul level	undergraduate					
	Courses		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	succe	essfully completed a	o assessment: completion of exerc approx. 50% of exercises will qualif ails at the beginning of the semeste	y for admission to							
	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)			_						

Subfield Theoretica	al Mechanics	and Quantu	m Mecl	hanics (16 ECTS cr	edits)					
11-T-MV-162-mo1	Theoretical	Mechanics								
	ECTS 5	Duratio		1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Courses		V (4)							
	Method of a	assessment			prox. 120 minutes)					
11-T-QV-162-m01	Quantum M	lochonics	Langu	age or assessmen	t: German and/or English					
11-1-QV-162-11101		Duratio	, [1 semester	Method of grading numerical grade	Modul level	undergraduate			
	ECTS 5	Duratio	V (4)	1 SeilleStei	Method of grading numerical grade	Modul level	undergraduate			
		assessment		n examination (and	prox. 120 minutes)		_			
	Method of t	assessificit			t: German and/or English					
11-T-TMQ-162-m01	Theoretical	Mechanics	and Qua	antum Mechanics	- Excercises	1				
	ECTS 6	Duratio	n [2 semester	Method of grading (not) successfully complete	d Modul level	undergraduate			
	Courses			$\dot{U}(2) + \ddot{U}(2)$ Nodule taught in: German or English						
	Method of a	assessment	To pas dents	Students must complete approx. 13 exercise sheets per semester. To pass the assessment, students must successfully complete approx. 50% of these exercises. The lecturer will inform students about the respective details at the beginning of the semester. Language of assessment: German and/or English						
Subfield Statistical	l Physics and	d Electrodyna								
11-T-SE-152-m01	Statistical Physics and Electrodynamics									
	ECTS 6	Duratio	n [2 semester	Method of grading numerical grade	Modul level	undergraduate			
	Courses	<u> </u>	V (4) +	· V (4)	· ·	•	•			
	Method of a	assessment	oral examination of one candidate each (approx. 30 minutes) Language of assessment: German and/or English							
Subfield Statistica	l Physics and	d Electrodyna	amics II	(10 ECTS credits)	-					
11-T-SA-152-m01	Statistical I	Physics - Exe	rcises							
	ECTS 5	Duratio	n	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Courses	·	Ü (2) Modul	e taught in: Ü: Ger	man or English	,				
	Method of a	assessment		n examination (appage of assessment	orox. 120 minutes) t: German and/or English					
11-T-EA-152-m01	Electrodyna	amics - Exerc	ises		-	1				
	ECTS 5	Duratio	n [1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Courses	·	Ü (2) Modul							
	Method of a	assessment	written examination (approx. 120 minutes) Language of assessment: German and/or English							
Bachelor's with 1 major N	Nathematical Phys	sics (2016)			JMU Würzburg • generated 19-Apr	-2025 • exam. reg. data	record 82 b55 - - H 2016 page 5 / 24			

Subfield Laboratory	y Course Physics (15 ECT	S credits)						
11-P-PA-152-m01	Laboratory Course Phys	sics A (Mechanics, Heat, Electromagnetism)						
	ECTS 3 Duratio	n 1 semester Method of grading (not) successfully completed Modul level undergraduate						
	Courses	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 Duratio	n 1 semester Method of grading (not) successfully completed Modul level undergraduate						
	Courses	V (1) + Ü (1) Module taught in: Ü: German or English						
	Method of assessment	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.						
	Additional Information	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 in LPO I	§ 53 Nr. 1 c) § 77 Nr. 1 d)						
11-P-MPB-152-mo1	Laboratory Course Phys	sics B for Students of Mathematical Physics						
	ECTS 4 Duratio	n Method of grading (not) successfully completed Modul level undergraduate						
	Courses	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 corpleted 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 prerequisites	Students are highly recommended to complete modules 11-P-PA and 11-P-FR1 prior to completing module 11-P-MPB.						

11-P-MPC-152-m01	Laborat	tory Cou	rse Phys	ics C fo	or Students of Math	nematical Physics				,	
_	ECTS	4	Duration	<u> </u>		Method of gradin	g (not) successfully	completed	Modul level	undergraduate	
	Courses	 S		P (2)			•		•		
	Method	l of asse	ssment	Prepa pleted comp sics-re	d if a Testat (exam) letion of all experim	d evaluating (record is passed. Exactly on nents, talk (with dis he module. Talks th	d of readings or lab re ne experiment that w cussion; approx. 30 r at were not successf	as not succ ninutes) to t	essfully completest the candidate	be considered successfully com- eted can be repeated once. After ate's understanding of the phy- eated once. Both components of	
	other pr	rerequis	ites	Stude	nts are highly recor	nmended to compl	ete module 11-P-MPB	prior to con	npleting modul	e 11-P-MPC.	
11-P-FR2-152-m01	Advance	ed and C	Computa	tional	Data Analysis						
	ECTS	2	Duration	1	1 semester	Method of gradin	g (not) successfully	completed	Modul level	undergraduate	
	Courses			V (1) +							
	Method	l of asse	ssment	Exerci Asses	xercises (successful completion of approx. 50% of approx. 10 exercise sheets) ssessment offered: Once a year, summer semester						
	other pr	rerequis	ites	Stude	nts are highly recor	nmended to compl	ete module 11-P-FR1 p	rior to comp	oleting module	11-P-FR2.	
Compulsory Electiv	es Math	ematics	(22 ECT	S credi	ts)						
Subgroup Basics o	f Mathem	natical N	/ethods	(9 ECT	S credits)						
10-M-DGE-152-m01	Introdu	ction to	Different	tial Ge	ometry						
	ECTS	9	Duration	<u> </u>	1 semester	Method of gradin	g (not) successfully	completed	Modul level	undergraduate	
	Courses	<u> </u>		V (4) -	+ Ü (2)	•	•		•	•	
				b) ora c) ora Langu Asses credit	Il examination of on I examination in gro lage of assessment sment offered: In th able for bonus	e candidate each (1 oups (groups of 2, 1 : German and/or En	inutes, usually chose 15 to 30 minutes) or o to 15 minutes per ca glish h the course is offere	andidate)	e subsequent s	emester	
10-M-DGL-152-m01	Ordinar	ry Differe	ential Eq	uation	S						
	ECTS	9	Duration		1 semester	Method of gradin	g (not) successfully	completed	Modul level	undergraduate	
	Courses			V (4) + Ü (2)							
	Method of assessment			b) ora c) ora Langu	l examination of on	e candidate each (1 oups (groups of 2, 1	15 to 30 minutes) or o to 15 minutes per ca				

10-M-FTH-152-m01	Introdu	ction to	Complex		/sis	1							
	ECTS	9	Duration	1	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate				
	Course	S		V (4)	+ Ü (2)	,							
				b) ora c) ora 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-GAN-152-	Geome	Geometric Analysis											
mo1	ECTS	9	Duration	1	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate				
	Courses			V (4)	+ Ü (2)								
	Method of assessment			b) ora c) ora Langu	written examination (approx. 90 to 180 minutes, usually chosen) or) oral examination of one candidate each (15 to 30 minutes) or oral examination in groups (groups of 2, 10 to 15 minutes per candidate) anguage of assessment: German and/or English reditable for bonus								
	Referre	d to in I	LPO I	§ 22 l	I Nr. 3 f)								
10-M-FAN-152-m01	Introdu	ction to	Function	al Ana	ılysis								
	ECTS	9	Duration	1	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate				
	Course				+ Ü (2)								
	Method	d of ass	essment	b) ora c) ora Langu	al examination of o	one candidate each (19	to 15 minutes per candidate)						
	Referre	d to in	LPO I	§ 22 l	I Nr. 3 f)								
10-M-PAR-152-m01	Introdu	ction to	Partial D	iffere	ntial Equations			,					
	ECTS	9	Duration	า	1 semester	Method of grading	(not) successfully completed	Modul level	undergraduate				
	Course	S		V (4)	+ Ü (2)								
	Method	d of ass	essment	b) ora c) ora Langu Asses	al examination of oll examination in § Lage of assessme	one candidate each (19 groups (groups of 2, 10 nt: German and/or Eng	to 15 minutes per candidate)	ne subsequent s	emester				

Subfield Overview			<u> </u>		<u> </u>							
10-M-DGGD- PÜ-152-m01			_			ferential Equations for Matl	<u> </u>		Lundaninadirata			
1 0 152 11101	ECTS	13	Duration		1 semester Method of grading numerical grade Modul level undergraduate							
	Course			. ,.	/ (4) + Ü (2)							
	Method	of ass	essment	Asses select cal M	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-FTDG-PÜ-152-	Overvi	w Com	plex Anal	ysis ar	d Differential Geo	metry for Mathematical Phy	/sics					
mo1	ECTS	13	Duration	1	1 semester	Method of grading num	erical grade	Modul level	undergraduate			
	Course	S	·	V (4) -	+ Ü (2)	•		•				
	Method of assessment			Asses select cal M 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-FTGD-PÜ-152-												
mo1	ECTS 13 Duratio			1	1 semester	Method of grading num	erical grade	Modul level	undergraduate			
	Course	S		V (4) -	$V(4) + \ddot{U}(2)$							
	Method	d 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 of selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mat cal Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). Language of assessment: German and/or English					Methoden (Overview Mathemati-			
10-M-GADG-	Overvi	ew Geor	metric Ana	alysis a	and Differential Ge	ometry for Mathematical Pl	hysics					
PÜ-152-m01	ECTS	13	Duration	i i	1 semester	Method of grading num	erical grade	Modul level	undergraduate			
	Course	S	•	V (4) -	V (4) + Ü (2)							
	Method of assessment			Asses select cal M	ssment will have re ted as the subject ethods) or in modu		e mathematics as agreed ub-field Gesamtüberblick	Mathematische	examiner. Each topic may only be Methoden (Overview Mathemati- itics).			

10-M-GAGD- PÜ-152-mo1	Overvi	ew Geo	metric Ana	alysis and Ordinary Differential Equations for Mathematical Physics								
PÜ-152-m01	ECTS	13	Duration		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 (20 to 40 minutes)							
				Assessme	ssessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be							
					lected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematil Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics).							
					anguage of assessment: German and/or English							
10-M-GAFT-PÜ-152-	Overvi	Overview Geometric Analysis and Complex Analysis for Mathematical Physics										
mo1	ECTS	13	Duration	1 1 S	semester	Method of grading	numerical grade	Modul level	undergraduate			
M FADG	Course	S	•	V (4) + Ü ((2)			•	-			
	Method	d of ass	essment	Assessme selected a cal Metho	ent will have refe as the subject of ods) or in module	one examination in t	pure mathematics as agreed ne sub-field Gesamtüberblick thematik (Supplementary Top	Mathematische	examiner. Each topic may only be Methoden (Overview Mathemati- atics).			
10-M-FADG-	Overvi	ew Fund	tional Ana	alysis and	sis and Differential Geometry for Mathematical Physics							
PÜ-152-m01	ECTS	13	Duration	1 S	semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	S		V (4) + Ü ((2)							
	Method of assessment		Assessme selected a cal Metho	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). Language of assessment: German and/or English								
10-M-FAGD-	Overvi	ew Fund	tional Ana	alysis and	Ordinary Differe	ntial Equations for M	athematical Physics					
PÜ-152-m01	ECTS	13	Duration	1 1 5	semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	S		V (4) + Ü ((2)							
				Assessme selected a cal Metho Language	ent will have refe as the subject of ods) or in module e of assessment:	one examination in t group Ergänzung Ma German and/or Engli	pure mathematics as agreed ne sub-field Gesamtüberblick thematik (Supplementary Top sh	Mathematische	examiner. Each topic may only be e Methoden (Overview Mathemati- itics).			
10-M-FAFT-PÜ-152-	Overvi	ew Fund	tional Ana	alysis and	Complex Analys	is for Mathematical F	hysics					
mo1	ECTS	13	Duration		semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course			V (4) + Ü (
	Method	d of ass	essment	Assessme selected a cal Metho	ent will have refe as the subject of ods) or in module	one examination in t	pure mathematics as agreed ne sub-field Gesamtüberblick thematik (Supplementary Top	Mathematische	examiner. Each topic may only be e Methoden (Overview Mathemati- ttics).			

10-M-FA- GA-PÜ-152-m01	Overvie	w Func	tional Ana	alysis and Geometric A	nalysis for Mathematical Physics							
GA-PÜ-152-m01	ECTS	13	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate					
	Course	S		V (4) + Ü (2)	·							
	Methoc	of ass	essment	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-							
					ct of one examination in the sub-field Gesamtubei Idule group Ergänzung Mathematik (Supplementa							
					ent: German and/or English	ily Topics in Mathema	uics).					
10-M-DG-	Overvie	w Diffe	rential Ge		ferential Equations for Mathematical Physics	,						
PA-PÜ-152-m01		13	Duration		Method of grading numerical grade	Modul level	undergraduate					
	Course	S		V (4) + Ü (2)	<u> </u>	•						
	Method	d of ass	essment	Assessment will have selected as the subje 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 Mathemati- el Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). Enguage of assessment: German and/or English							
10-M-GD-	Overvie	w Ordi	nary Diffe	rential Equations and	Partial Differential Equations for Mathematical Ph	nysics						
PA-PÜ-152-m01	ECTS	13	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate					
	Course	S		V (4) + Ü (2)								
				Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic ma selected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview M cal Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). Language of assessment: German and/or English								
10-M-FTPA-PÜ-152-	Overview Complex Analysis and Partial Differential Equations for Mathematical Physics											
mo1	ECTS	13	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate					
	Course	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 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). Language of assessment: German and/or English								
10-M-GA-	Overvie	w Geor	netric Ana	alysis and Partial Diffe	rential Equations for Mathematical Physics	,						
PA-PÜ-152-m01	ECTS	13	Duration	1 semester	Method of grading numerical grade	Modul level	undergraduate					
	Course	S		V (4) + Ü (2)	·							
	Method	d of ass	essment	Assessment will have selected as the subje cal Methods) or in mo	ne candidate each (20 to 40 minutes) reference to two topics in pure mathematics as ag ct of one examination in the sub-field Gesamtüber Indule group Ergänzung Mathematik (Supplementa ent: German and/or English	rblick Mathematische	e Methoden (Overview Mathemati-					

10-M-FAPA-PÜ-152-	Overvi	ew Fund	tional An	alysis	llysis and Partial Differential Equations for Mathematical Physics						
mo1	ECTS	13	Duratio	1	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	es		V (4)	+ Ü (2)						
	Metho	d of ass	sessment	Asses select cal M	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						
Mathematical Phys	sics (18	ECTS cr	edits)								
Module Group Sup											
10-M-NUM1P-152-	Numer	ical Ma			Mathematical Phys						
mo1	ECTS	10	Duratio		1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course				+ Ü (2)						
				b) ora c) ora Langu credit	al examination of o l examination in gr uage of assessmen table for bonus	approx. 90 to 180 minutes, usually chosen) or ne candidate each (15 to 30 minutes) or oups (groups of 2, 10 to 15 minutes per candidate) t: German and/or English					
10-M-NUM2P-152-	Numerical Mathematics 2 for Mathematical Physics										
mo1	ECTS	10	Duratio	,	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	es		V (4)	+ Ü (2)						
	Method of assessment			b) ora c) ora Langu	ıl examination of o I examination in gı	approx. 90 to 180 minutes, usually chosen) or ne candidate each (15 to 30 minutes) or oups (groups of 2, 10 to 15 minutes per candidate) t: German and/or English					
10-M-STO1P-152-	Stocha	stics 1	for Mathe	matica	l Physics			_			
mo1	ECTS	10	Duratio		1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course				+ Ü (2)						
	Metho	d of ass	sessment	b) ora c) ora Langu	al examination of o I examination in gr	approx. 90 to 180 minutes, usually chosen) or ne candidate each (15 to 30 minutes) or roups (groups of 2, 10 to 15 minutes per candidate) t: German and/or English					

10-M-STO2P-152-	Stocha	stics 2	for Mathe	matica	al Physics						
mo1	ECTS	10	Duration	1	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S		V (4) ·	/ (4) + Ü (2)						
	Method	d of ass	essment	b) ora c) ora Langu) written examination (approx. 90 to 180 minutes, usually chosen) or) oral examination of one candidate each (15 to 30 minutes) or) 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-ALGP-152-	Introdu	iction to	Algebra	for Ma	thematical Physic	s					
mo1	ECTS	10	Duration	ı	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S		V (4) ·	+ Ü (2)						
	Method of assessment			b) ora c) ora Langu) written examination (approx. 90 to 180 minutes, usually chosen) or) oral examination of one candidate each (15 to 30 minutes) or) 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-DIMP-152-	Introdu	iction to	Discrete	Mathe	ematics for Mather	natical Physics					
mo1	ECTS	10	Duration	ı	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S		V (4) ·	+ Ü (2)						
	Method of assessment			a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus							
10-M-PGEP-152-	Introdu	iction to	Projectiv	e Geo	metry for Mathema	atical Physics	,				
mo1	ECTS	10	Duration	1	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S		V (4) ·	+ Ü (2)						
	Method of assessment			b) ora c) ora Langu Asses	al examination of or l examination in gr uage of assessmen	approx. 90 to 180 minutes, usually chosen) or ne candidate each (15 to 30 minutes) or roups (groups of 2, 10 to 15 minutes per candidate) t: German and/or English the semester in which the course is offered and in th	e subsequent se	emester			

10-M-ZTHP-152-	Introdu	Introduction to Number Theory for Mathematical Physics												
mo1	ECTS	10	Duration	า	1 semester	Method of grading	numerical grade	Modul level	undergraduate					
	Course	S	•	V (4)	+ Ü (2)	•	•	·						
	Method	d of ass	sessment	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-	Operat	ions Re	esearch fo	r Math	ematical Physics			,						
SP-152-m01	ECTS	10	Duration		1 semester	Method of grading	numerical grade	Modul level	undergraduate					
	Course	S		V (4)	+ Ü (2)	•								
				b) ora c) ora Langu Asses credit) written examination (approx. 90 to 180 minutes, usually chosen) or) oral examination of one candidate each (15 to 30 minutes) or) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) anguage of assessment: German and/or English ssessment offered: In the semester in which the course is offered and in the subsequent semester reditable for bonus									
10-M-DGEP-152-	Introdu	ntroduction to Differential Geometry for Mathematical Physics												
mo1	ECTS	10	Duration	1	1 semester	Method of grading	numerical grade	Modul level	undergraduate					
	Course	S		V (4)	+ Ü (2)									
				b) ora Asses lected Methol Langu Asses credit	al examination in g ssment will have re d as the subject of ods) or in module g uage of assessmen ssment offered: In t able for bonus	ference to a topic in pone examination in the group Ergänzung Matt: German and/or Engthe semester in which	s (10 to 15 minutes each) oure mathematics as agreene sub-field Gesamtüberb hematik (Supplementary T	lick Mathematische M Topics in Mathematics						
10-M-DGLP-152-	Ordina	ry Diffe	rential Eq	uation	s for Mathematica	l Physics								
mo1	ECTS	10	Duration		1 semester	Method of grading	numerical grade	Modul level	undergraduate					
	Course	S		` ' '	+ Ü (2)									
	Method of assessment				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). Language of assessment: German and/or English creditable for bonus									

10-M-FT-	Introdu	uction to	Complex	Analy	Analysis for Mathematical Physics							
HP-152-m01	ECTS	10	Duration	า	1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course	25	·	V (4) -	+ Ü (2)			,				
	Method	d of ass	essment		a) oral examination of one candidate each (15 to 30 minutes) or							
				b) ora	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).							
					nguage of assessment: German and/or English							
	_				reditable for bonus							
10-M-GANP-152-	<u> </u>	_			matical Physics	1						
mo1		ECTS 10 Duratio			1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Courses			V (4) -					_			
	Method	d of ass	essment			ne candidate each (15						
				D) ora	il examination in gi	oups of 2 candidates	(10 to 15 minutes each)	on with the exar	miner. Each topic may only be se-			
									Nethoden (Overview Mathematical			
				Metho	ods) or in module g	group Ergänzung Math	nematik (Supplementary Topics					
					anguage of assessment: German and/or English reditable for bonus							
AA FAND						(* 151 *						
10-M-FANP-152- mo1		Introduction to Function ECTS 10 Duratio					numarical arada	Modul level	undergreduete			
11101					1 semester	Method of grading	numerical grade	Modul level	undergraduate			
	Course			V (4) -		1:1 / 1 /						
	Method	a or 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)							
					of 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 se-							
				lected	as the subject of	one examination in th	ne sub-field Gesamtüberblick M	lathematische <i>N</i>	Nethoden (Overview Mathematical			
							nematik (Supplementary Topics	in Mathematics	5).			
				Langu	lage of assessmen able for bonus	t: German and/or Eng	gusn					
10-M-PARP-152-	Introdu	iction to	Partial D			Mathematical Physic	e					
mo1	ECTS	10	Duration		1 semester	Method of grading		Modul level	undergraduate			
	Course		2 4. 4	V (4) -			Thamerical State	1	Tanao.g.uuuuto			
			essment			ne candidate each (15	to 30 minutes) or					
		a 0. ass		b) ora	l examination in gr	oups 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 se-							
					ected as the subject of one examination in the sub-field Gesamtüberblick Mathematische Methoden (Overview Mathematica Methods) or in module group Ergänzung Mathematik (Supplementary Topics in Mathematics). Language of assessment: German and/or English							
					Assessment offered: In the semester in which the course is offered and in the subsequent semester							
					able for bonus			<u> </u>				

10-M-MWR-152-	Modeli	ing and	Computa	tional	Science		.,				
mo1	ECTS	8	Duratio	n	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S			V (4) + Ü (2) Module taught in: German and/or English						
	Method	d of ass	essment	b) ora c) ora Langi	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						
Module Group Exp	erimenta	al Physi	ics								
11-E-O-152-m01	Optics	and Wa	aves								
	ECTS	8	Duratio	n	1 semester	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 Duratio		n	1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Course	Courses			+ Ü (2) ıle taught in: Ü: Ge	rman or English					
	Method of assessment			written examination (approx. 120 minutes) Language of assessment: German and/or English							
11-E-F-152-m01	Introdu	ıction t	o Solid St	tate Physics							
	ECTS	8	Duratio	n	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S			+ Ü (2) ıle taught in: Ü: Ge	rman or English		-			
	Method	d of ass	sessment		written examination (approx. 120 minutes) Language of assessment: German and/or English						
11-E-T-152-m01	Nuclea	r and E	lementary	Partic	le Physics						
	ECTS	6	Duratio	n	1 semester	Method of grading numerical grade	Modul level	undergraduate			
	Course	S			V (3) + Ü (1) Module taught in: Ü: German or English						
	Method of assessment			written examination (approx. 120 minutes) Language of assessment: German and/or English							

Module Group Sup	plementary Topic	cs in Phy	sics						
11-GRT-152-m01	Group Theory								
	ECTS 6	Duration	1	semester	Method of gradi	ng numerical grade	Modul level	graduate	
	Courses		V (2) + R Module	(2) taught in: Germ	nan or English				
	Method of asse		a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed,						
			the lectu	ırer must inforr		s by four weeks prior to	the original examination		
11-CP-152-m01	Computational	Physics	,						
	ECTS 6	Duration	1	semester	Method of gradi	ng numerical grade	Modul level	undergraduate	
	Courses		V (3) + R Module	(1) taught in: Germ	nan or English				
	Method of asse		b) oral e c) oral e d) project If a writt form of a the lectu Languag	xamination of oxamination in got report (approen examination an oral examination are must inforroe of assessme	groups (groups of 2, ox. 8 to 10 pages) or on was chosen as met ation of one candida	(approx. 30 minutes) or approx. 30 minutes per or approx. 30 minutes per or approximate for a ssessment, this te each or an oral examinates by four weeks prior to an applish	ssessment may instead take the nethod of assessment is changed, date at the latest.		
11-SDC-152-m01	Statistics, Data			nputer Physics					
		Duration		semester	Method of gradi	ng numerical grade	Modul level	graduate	
	Courses		V (2) + R Module	(1) taught in: Germ	nan or English				
	Method of asse		a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: German and/or English Assessment offered: Once a year, winter semester						

11-AP-152-m01	Astropl	nysics								
	ECTS	6	Duration	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate	
	Course	S		V (2) - Modu	R (2) le taught in: Germ	an or English				
	Method	l 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						
	Referred to in LPO I			§ 22 Nr. 1 h) § 22 Nr. 2 f) § 22 Nr. 3 f)						
11-TPS-152-m01	Particle Physics (Standard Model)									
	ECTS	8	Duration	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate	
	Course	S		V (4) - Modu	R (2) le taught in: Germ	an or English				
	Method	l of ass	essment	b) ora c) ora d) pro e) pre If a wi form o the le	l examination of call examination in gale in gent report (approsentation/talk (apritten examination of an oral examination cturer must inform	x. 8 to 10 pages) or oprox. 30 minutes). was chosen as methodition of one candidate 6	prox. 30 minutes) or prox. 30 minutes per candidate do of assessment, this may be ceach or an oral examination in y four weeks prior to the original	hanged and ass groups. If the m	sessment may instead take the ethod of assessment is changed, date at the latest.	

11-RTTB-232-m01	Theory	of Relat	tivity								
	ECTS	6	Duration	n	1 semester	Method of grading numerica	al grade	Modul level	undergraduate		
	Courses	,			+ R (1) ule taught in: Germ	nan or English					
	Method	of asse	essment	b) ora c) ora d) pro e) pro If a w form the lo Lang	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						
	Additio	nal Info	rmation	Appr	oval from examina	tion committee required					
Module Group Curr	ent Topic	cs in Ma	athematic	cal Ph	ysics						
11-BXMP5-152-m01	Current	Topics	in Mathe	matic	al Physics						
	ECTS	5	Duration	n	1 semester	Method of grading numerica	al grade	Modul level	undergraduate		
	Courses	5		V (2)	+ R (2)	·		-			
	Method	of asse	essment	amin on/ta If a w form the le	ation in groups (gr alk (approx. 30 min rritten examination of an oral examina ecturer must inform	roups of 2, approx. 30 minutes penutes). In was chosen as method of asses Ation of one candidate each or an	er candidate) or proje ssment, this may be c n oral examination in s	ne candidate each (approx. 30 minutes) or oral roject report (approx. 8 to 10 pages) or present be changed and assessment may instead take in in groups. If the method of assessment is chaiginal examination date at the latest.			
	other pr	rerequis	sites	Appr	oval from examina	tion committee required.					
11-BXMP6-152-	Current	Topics	in Mathe	matic	al Physics						
mo1	ECTS	6	Duration		1 semester	Method of grading numerica	al grade	Modul level	undergraduate		
	Courses				+ R (1)						
				amin on/ta If a w form the le Lang	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 change 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 pr	erequis	sites	Appr	oval from examina	tion committee required.					

11-BXMP8-152-	Current Top	ics in Mathe	ematical Physics		'					
mo1	ECTS 8	Duratio	n 1 semester	Method of grading numerical grade	Modul level	undergraduate				
	Courses	· ·	V (4) + R (2)		*					
	Method of a	assessment	amination in groups on/talk (approx. 30 r If a written examinat form of an oral exam the lecturer must info	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 prered	quisites	Approval from exami	nation committee required.						
Key Skills Area (2	o ECTS credits	s)								
General Key Skills In addition to the			dents may also take m	odules offered by JMU as part of the pool of gener	al transferable skills	(ASQ).				
General Key Skills	s (subject-spe	cific)								
10-M-Tu-	Exercise tut	or or proof-	reading in Mathematio	CS .						
Ko-152-mo1	ECTS 5	Duratio	n 1 semester	Method of grading (not) successfully comp	eted Modul level	undergraduate				
	Courses	,	T (o)							
	Method of assessment		Assessment of tutori approx. 5 pieces of c	ng activities or correcting work by supervising lecti orrecting work)	urers or exercise supe	ervisors (1 to 2 teaching units or				
	Additional I	nformation	Please direct application to teaching coordinator Mathematics, he/she will select participants.							
	Referred to	in LPO I	§ 22 Nr. 3 f)							
10-M-VHB1-152-	E-Learning	and Blended	Learning Mathematic	CS 1	'					
mo1	ECTS 2	Duratio		Method of grading (not) successfully comp	eted Modul level	undergraduate				
	Courses		Ü (2) Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)							
	Method of a	assessment	project (web-based, Assessment offered:	15 to 20 hours) Once a year, winter semester						
10-M-VHB2-152-	E-Learning	and Blended	Learning Mathematic	CS 2						
mo1	ECTS 2	Duratio	n 1 semester	Method of grading (not) successfully comp	eted Modul level	undergraduate				
	Courses		Ü (2) Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)							
	Method of a	ssessment	project (web-based, 15 to 20 hours) Assessment offered: Once a year, summer semester							

11-P-VKM-152-m01	Prepara	atory Co	urse Mat	hemat	ics							
	ECTS	2	Duration	1	1 semester	Method of grading (not) successfully completed Mo	odul level	undergraduate				
	Courses	5		T (2)								
	Method	l of asse	essment			completion of approx. 50% of approx. 6 exercise sheets)	or					
					talk (approx. 15 minutes) sessment offered: Once a year, winter semester							
	Referred to in LPO I			§ 22 l	§ 22 Nr. 1 h) § 22 Nr. 2 f) § 22 Nr. 3 f)							
Subject-specific Ke	y Skills ((15 ECTS	S credits)									
Compulsory Course	es (9 ECT	S credit	ts)									
10-M-GBM-152-	Basic No	otions a	and Meth	ods of	Mathematical Reas	soning						
mo1	ECTS	2	Duration		1 semester	Method of grading (not) successfully completed Mo	odul level	undergraduate				
	Courses			V (1) +	_ ` `							
	Method of assessment				Language of assessment: German and/or English							
	Additional Information			Addit	ional information or	n module duration: block taught prior to the beginning of	f the lecture	period.				
	Referred to in LPO I				l Nr. 1 h) l Nr. 2 f)							
10-M-ASM-152-	Reasoni	ing and	Writing	n Matl	hematics							
mo1	ECTS	2	Duration		1 semester	Method of grading (not) successfully completed Mo	odul level	undergraduate				
	Courses			V (1) +								
	Method of assessment		essment		project (10 to 20 pages) Language of assessment: German and/or English							
11-SMP-162-m01	Semina	r Mathe	ematical I	Physic	5							
	ECTS	5	Duration		1 semester	Method of grading (not) successfully completed Mo	odul level	undergraduate				
	Courses				le taught in: Germa	n or English						
	Method	l of asse	essment		50 to 120 minutes) lage of assessment	: German and/or English						
Subject-specific Ke	Key Skills, Compulsory Electives (6 ECTS credits)											
10-M-SEM2-152-	Suppler	mentary	/ Semina	r Math	ematics							
mo1	ECTS	4	Duration	1	1 semester	Method of grading (not) successfully completed Mo	odul level	undergraduate				
	Courses	5		S (2)								
	Method of assessment				talk (60 to 120 minutes) Language of assessment: German and/or English							

40 M TOD 450 most	Introd.	ction to	Topolo								
10-M-TOP-152-m01						Markey de Court Court Court Court Court	NA - 1 1	Londonous docate			
	ECTS	5	Duration		1 semester	Method of grading (not) successfully completed	Modul level	undergraduate			
	Course			V (2) -				-			
				b) ora c) ora Langu Asses 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) Language of assessment: German and/or English Assessment offered: In the semester in which the course is offered and in the subsequent semester creditable for bonus						
10-M-COM-152-	Compu	tational	Mathem	atics							
mo1	ECTS	4	Duration	1	1 semester	Method of grading (not) successfully completed	Modul level	undergraduate			
	Course	S	-	V (1) +	- Ü (2)	·					
	Method	d of asse	essment	Langu	roject in the form of programming exercises (approx. 20 to 25 hours) anguage of assessment: German and/or English ssessment offered: Once a year, winter semester						
	Referre	d to in L	PO I	§ 22 l	Nr. 3 f)						
10-M-PRG-152-m01	Prograi	mming o	ourse for	stude	students of Mathematics and other subjects						
	ECTS	3	Duration	า	1 semester	Method of grading (not) successfully completed	Modul level	undergraduate			
	Course	S		P (2)	,		•				
	Method	d of asse	essment	project in the form of programming exercises (approx. 20 to 25 hours) Language of assessment: German and/or English Assessment offered: Once a year, summer semester							
	Referre	d to in L	PO I	§ 22 l	Nr. 3 f)						
10-M-GES-152-m01	Selecte	d Topic	s in Histo	ry of N	Mathematics						
	ECTS	5	Duration	1	1 semester	Method of grading (not) successfully completed	Modul level	undergraduate			
	Course	S		V (2) -	+ Ü (2)		•				
		,		b) teri c) pro Langu Asses	sment offered: In t	ages) or	e subsequent se	emester			
	Referre	d to in L	PO I	§ 22 l	Nr. 3 f)						

10-M-MSC-152-	Mather	matical	Writing						-		
mo1	ECTS	5	Duration		1 semester	Method of grading (not) succes	sfully completed	Modul level	undergraduate		
	Course	S		V (2)	+ Ü (2)	<u>.</u>					
	Method	d of ass	essment	b) ter c) pro Langu	a) talk (45 to 90 minutes) or b) term paper (10 to 15 pages) or c) project work (15 to 25 hours) Language of assessment: German and/or English Assessment offered: In the semester in which the course is offered and in the subsequent semester						
	Referre	d to in	LPO I	§ 22 l	22 II Nr. 3 f)						
10-M-SCH-152-m01	School	Mathe	matics fro	m a Hi	gher Perspective						
	ECTS	5	Duration	า	1 semester	Method of grading (not) succes	sfully completed	Modul level	undergraduate		
	Course	S		V (2)	+ Ü (2)						
	Method	d of ass	essment	b) ter c) pro Langu	talk (approx. 45 minutes) or term paper (10 to 15 pages) or project work (15 to 25 hours) inguage of assessment: German and/or English assessment offered: In the semester in which the course is offered and in the subsequent semester						
		d to in		§ 22 Nr. 1 h) § 22 Nr. 2 f) § 22 Nr. 3 f)							
10-M-PRO-152-mo1	Prosen	ninar M	athematic	:S							
	ECTS	4	Duration	1	1 semester	Method of grading (not) succes	sfully completed	Modul level	undergraduate		
	Course	S		S (2)							
	Method	d of ass	essment	Langi		German and/or English s semester in which the course is	offered				
11-M-MR-152-m01	Mather	matical	Methods	of Phy	sics						
	ECTS	6	Duration	า	2 semester	Method of grading (not) succes	sfully completed	Modul level	undergraduate		
	Course	S			+ Ü (1) + V (2) + Ü (1) le taught in: Germa						
	Method	d of ass	essment	a) exe b) tal	a) exercises (successful completion of approx. 50% of approx. 13 exercise sheets) or b) talk (approx. 15 minutes)						
	Referred to in LPO I			§ 53 Nr. 1 a) § 77 Nr. 1 a)							

11-CP-152-m01	Compu	tational	Physics								
	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						
	Method of assessment		a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or 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, winter semester								
Thesis (10 ECTS cre	dits)										
10-M-BAP-152-m01	Bachel	or Thesi	is Mather	natical	Physics						
	ECTS	10	Duratio	n	1 semester	Method of grading	numerical grade	Modul level	undergraduate		
	Course	S		No co	urses assigned to m	nodule					
	Method of assessment			writte	written thesis (approx. 250 to 300 hours total)						
	other prerequisites			Where	Where applicable, topic-specific modules as specified by supervisor.						
	Additional Information			Time t	Time to complete: 10 weeks.						