

Module Catalogue

for the Subject

Mathematics International

as a Master's with 1 major with the degree "Master of Science" (120 ECTS credits)

Examination regulations version: 2022 Responsible: Faculty of Mathematics and Computer Science Responsible: Institute of Mathematics

JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record 88|h79|-|-|H|2022



Contents

The subject is divided into		4
Learning Outcomes		5
_	tions, Notes, In accordance with	6
Compulsory Electives		7
Mathematics		8
Applied Analysis		9
Topics in Algebra		11
Differential Geometry Complex Analysis		12
Geometric Structures		13
Industrial Statistics 1		14
Lie Theory		15 16
Numeric of Large Systems of Equ	ations	18
Basics in Optimization		10
Control Theory		20
Stochastic Models of Risk Manag	rement	20
Stochastical Processes		22
Topology		23
Insurance Mathematics 1		24
Time Series Analysis		25
Number Theory		26
Giovanni Prodi Lecture (Master)		28
Selected Topics in Analysis		30
Algebraic Topology		31
Selected Topics in Financial Math	nematics	32
Groups and their Representations		33
Geometrical Mechanics		34
Industrial Statistics 2		36
Field Arithmetics		37
Numeric of Partial Differential Eq	uations	38
Selected Topics in Optimization		39
Mathematical Statistics		40
Insurance Mathematics 2		41
Discrete Mathematics		42
Dynamical Systems		43
Aspects of Geometry		44
Mathematical Continuum Mechar	nics	45
Mathematical Imaging		46
Selected Topics in Mathematical		47
Selected Topics in Control Theory	1	48
Inverse Problems 1		49
Module Theory		50
Non-linear Analysis		51
Optimal Control		52
Networked Systems		53
Complex Geometry	Inthomatical Physics	54
Partial Differential Equations of N		55
Pseudo Riemannian and Riemann Functional Analysis	nall deolletry	57
Applied Differential Geometry		59
Giovanni Prodi Lecture Selected	Tonics (Master)	60 61
Giovanni Prodi Lecture Scielled		63
Giovanni Prodi Lecture Modern Te		65
Statistic roar Lecture modelli h		5
Master's with 1 major Mathematics International (2022)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data re- cord Master (120 ECTS) Mathematics International - 2022	page 2 / 117

Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Geometric Complex Analysis	67
Selected Topics in Numerical and Applied Mathematics	68
Cryptography/Coding Theory	69
Computer Algebra	70
Algorithmic Number Theory	71
Algebraic Geometry	72
Analytic Number Theory	73
Inverse Problems 2	74
Selected Topics in Complex Analysis	75
Research in Groups and Seminars	76
Research in Groups - Algebra	77
Research in Groups - Discrete Mathematics	78
Research in Groups - Dynamical Systems and Control Theory	79
Research in Groups - Complex Analysis	80
Research in Groups - Geometry and Topology	81
Research in Groups - Mathematics in Context	82
Research in Groups - Mathematics in the Sciences	83
Research in Groups - Measure and Integral	84
Research in Groups - Numerical Mathematics and Applied Analysis	85
Research in Groups - Robotics, Optimization and Control Theory	86
Research in Groups - Time Series Analysis	87
Research in Groups - Statistics	88
Research in Groups - Number Theory	89
Research in Groups - Control Theory of Quantum Mechanical Systems	90
Research in Groups - Differential Geometry	91
Research in Groups - Deformation Quantization	92
Research in Groups - Non-linear Analysis	93
Research in Groups - Operator Algebras	94
Seminar in Applied Differential Geometry	95
Seminar in Algebra	96
Seminar in Dynamical Systems and Control	97
Seminar in Complex Analysis	98
Seminar in Financial and Insurance Mathematics	99
Seminar in Geometry and Topology	100
Giovanni Prodi Seminar (Master)	101
Interdisciplinary Seminar	103
Seminar Mathematics in the Sciences	104
Seminar in Numerical Mathematics and Applied Analysis	105
Seminar in Optimization	106
Seminar in Statistics	107
Seminar in Non-linear Analysis	108
Seminar in Applied Mathematics	109
Research in Groups - Lie Theory	110
Research in Groups - Applied Differential Geometry	111
Research in Groups - Mathematical Physics	112
Research in Groups - Higher Structures	113
Research in Groups - Functional Analysis	114
Research in Groups - Inverse Problems	115
Thesis	116
Master Thesis Mathematics International	117



The subject is divided into

section / sub-section	ECTS credits	starting page
Compulsory Electives	90	7
Mathematics	30	8
Research in Groups and Seminars	20	76
Thesis	30	116

Learning Outcomes

Scientific qualification

UNIVERSITÄT

WÜRZBURG

- Graduates are trained in analytical thinking, possess a highly developed capacity for abstraction, universally applicable problem-solving skills and the ability to structure complex relationships.
- Graduates are able to independently familiarise themselves with current research areas in mathematics using specialised literature.
- Graduates are able to present their knowledge, ideas and solutions to complex issues in English to an international audience of experts in a comprehensible way.
- Graduates possess the specialised knowledge, thought processes and methodological skills required for independent scientific work, in particular for doctoral studies.
- Graduates know the rules of good scientific practice and are able to observe them in extensive work.
- Graduates have advanced knowledge of current areas of mathematics and are able to confidently use advanced methods in these areas.
- Graduates have in-depth knowledge and an overview of a current research topic from at least one area of mathematics.

Ability to take up employment

- Graduates are trained in analytical thinking, possess a highly developed capacity for abstraction, universally applicable problem-solving skills and the ability to structure complex relationships.
- Graduates are able to formulate and present their knowledge, ideas and problem solutions in English in a way that is understandable to the target audience.
- Graduates are able to recognise, structure and model complex problems from other fields (such as the natural sciences, engineering or economics), develop solutions using mathematical methods and interpret and evaluate these results.
- The graduates have resilience in solving complex problems.
- The graduates are able to work constructively and oriented towards a goal in international teams and are able to take responsibility for a wide range of tasks.
- Graduates are able to develop new fields of knowledge independently, efficiently and systematically.

Personal development

- Graduates are trained in analytical thinking, possess a highly developed capacity for abstraction, universally applicable problem-solving skills and the ability to structure complex relationships.
- Graduates can play a constructive role in participatory processes.
- The graduates have resilience in solving complex problems.
- Graduates are able to formulate complex ideas and proposed solutions in a generally understandable way and present them professionally.
- Graduates possess intercultural skills and can communicate and act in an international environment.

Abbreviations used

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

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

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

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

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

Conventions

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

Notes

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

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

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

In accordance with

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

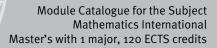
ASPO2015

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

02-Feb-2022 (2022-6)

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.





Compulsory Electives

(90 ECTS credits)



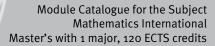


Mathematics

(30 ECTS credits)

Module title			Abbreviation			
Applied Analysis			10-M=AAANin-152-1	n01		
Module	e coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mather	natics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
theory of particul theory of Recomm	of Hilbe lar FEM of ellip mende	v of functional analysis ert spaces and Fourier a methods), principles o tic, parabolic and hype d previous knowledge: h the contents of the m	nalysis, spectral theor If functional analysis, f bolic partial differenti	y and quantum mech unction spaces, emb al equations with me	hanics, numerical m bedding theorems, c thods from function	ethods (in ompactness,
		ning outcomes			Jiiiiieiided.	
The stu to estal	dent is blish a	acquainted with the fu connection between hi ther natural and engine	s/her acquired skills a		e ,	
Course	S (type, n	umber of weekly contact hours	, language — if other than Gei	rman)		
V (4) + I Module		t in: English				
Method	d of ass	essment (type, scope, lang	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
module is	creditab	le for bonus)				
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to ation of one candidate ation in groups (groups ssessment: English ffered: In the semester bonus	each (approx. 20 minu of 2, 15 minutes per c	utes) or andidate)	ıbsequent semester	
Allocati						
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachir	ng cycl	9				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master's degree (1 major) Mathematics International (2015)						
Master's degree (1 major) Physics International (2020)						
Master's degree (1 major) Mathematics International (2021)						
Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Physics International (2024)						
	-	ee (1 major) Physics Int		operated to Approximate the	rog data to	
Master's Wi (2022)	ai i majol	mathematics international		enerated 19-Apr-2025 • exam ECTS) Mathematics Internati	-	page 9 / 117





Master's degree (1 major) Mathematics International (2025)

Module title			Abbreviation		
Topics in Algebra				10-M=AALGin-152-m01	
Module	coord	inator		Module offered by	
Dean of	Studie	es Mathematik (Mathema	tics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
algebra	•	topics in algebra, for exa d previous knowledge:	Imple coding theory,	elliptic curves, algeb	oraic combinatorics or computer
	nowled	lge of algebra is assumed	l, such as can be acq	uired in the modules	s "Introduction to Algebra" and
Intende	d learr	ning outcomes			
		acquainted with fundam se skills to complex ques		nethods in a contem	porary field of algebra, and is ab-
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V (4) + l Module		t in: English			
		essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
b) oral (c) oral (Langua)	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups o ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu if 2, 15 minutes per ca	tes) or andidate)	ibsequent semester
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
300 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master's degree (1 major) Mathematics International (2015)					
		ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master'	Master's degree (1 major) Mathematics International (2025)				

Module title			Abbreviation			
Differential Geometry			10-M=ADGMin-152-	m01		
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mather	natics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		•			
folds. Recom	mende	dvanced results in diffe d previous knowledge: lge from the modules "				
		s" is recommended.				
The stu	dent is	acquainted with conce these methods and kno				
Course	S (type, r	number of weekly contact hours	s, language — if other than Ge	rman)		
V (4) + Module		t in: English				
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
b) oral c) oral Langua	examir examin Ige of a ment o	mination (approx. 90 to nation of one candidate ation in groups (groups ssessment: English ffered: In the semester bonus	each (approx. 20 minu 5 of 2, 15 minutes per c	utes) or andidate)	ıbsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Physics International (2020) Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Physics International (2024) Master's degree (1 major) Mathematics International (2025)						
Master's wi (2022)	ith 1 majoi	r Mathematics International		enerated 19-Apr-2025 • exam ECTS) Mathematics Internat	_	page 12 / 117

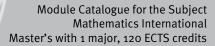
Module title			Abbreviation			
Complex Analysis 10-M=AFTHin-152-m01					101	
Module	e coord	inator		Module offered by		
Dean o	f Studie	es Mathematik (Mather	natics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites	i la		
1 seme	ster	graduate				
Conten	ts					
geome ons (e. Recom	tric met g. ellip mende	y of mapping properties thods. Structural prope tic functions). d previous knowledge: lge of the contents of th	rties of families of hold	omorphic and merom	orphic functions. Sp	pecial functi-
Intende	ed learı	ning outcomes				
ticular	the (ge	acquainted with the fu ometric) mapping prop ner acquired skills and	erties of holomorphic f	unctions. He/She is	able to establish a c	onnection
Course	S (type, n	number of weekly contact hours	, language — if other than Ge	rman)		
V (4) + Module		t in: English				
Metho	d of ass	Sessment (type, scope, lang	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
	-	le for bonus)				
b) oral c) oral Langua	examin examin Ige of a ment o	mination (approx. 90 to nation of one candidate ation in groups (groups ssessment: English ffered: In the semester bonus	each (approx. 20 minu of 2, 15 minutes per c	utes) or andidate)	ıbsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master uppears in Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Physics International (2020) Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Physics International (2024) Master's degree (1 major) Mathematics International (2025) Master's with 1 major Mathematics International JMU Würzburg • generated 19-Apr-2025 • exam. reg. data re- page 13 / 117						
(2022)			cord Master (120	ECTS) Mathematics Internat	onal - 2022	

Module title				Abbreviation	
Geometric Structures				10-M=AGMSin-152-m01	
Module coordinator Module offere			Module offered by		
Dean of	fStudie	es Mathematik (Mathema	tics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
ang cor	dition	s, classification results.	related geometric str	uctures, automorph	isms, BN pairs in groups, Mouf-
	nowled	d previous knowledge: Ige from the modules "Int	troduction to Differen	tial Geometry" and "	'Introduction to Topology" is re-
Intende	ed learr	ning outcomes			
structu	re. He/		connection between	these results and b	oncerning a type of geometric roader theories, and learns
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V (4) + l Module		t in: English			
		essment (type, scope, language le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
		nination (approx. 90 to 1	20 minutes usually o	hosen) or	
		ation of one candidate e			
		ation in groups (groups o	of 2, 15 minutes per ca	andidate)	
Assessi	ment o	ssessment: English ffered: In the semester in	which the course is o	offered and in the su	bsequent semester
credital Allocati					
Allocal		παιτο			
 Additia	nalinf	ormation			
Auuiti0					
Worklo	ad				
300 h	uu				
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master's degree (1 major) Mathematics International (2015)					
	Master's degree (1 major) Mathematics International (2013) Master's degree (1 major) Mathematics International (2021)				
Master'	s degre	ee (1 major) Mathematics	International (2022)		
Master'	Master's degree (1 major) Mathematics International (2025)				

title		Abbreviation			
Industrial Statistics 1				10-M=AISTin-152-m01	
coord	inator		Module offered by		
fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
Metho	od of grading	Only after succ. com	pl. of module(s)		
nume	rical grade				
n	Module level	Other prerequisites			
ster	graduate				
ts					
ed learr	ning outcomes				
dent m	asters the fundamental s	statistical methods fo	or industrial applicati	ions.	
5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
	t in: English				
		ge — if other than German, e	examination offered — if no	t every semester, information on whether	
examin examin ge of a ment o	ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in	ach (approx. 20 minu of 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester	
nal info	ormation				
ad					
300 h Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master's degree (1 major) Mathematics International (2015)					
0	. , ,	· · /			
-					
	e coordi f Studie Metho numer n ster ster dof para analysi ed learr dent m s (type, n U (2) taughi l of ass creditab en exar examin ge of a ment o ble for ion of p nal info ad d to in s degre s degre s degre	ial Statistics 1 ial Statistics 1 coordinator f Studies Mathematik (Mathema Method of grading numerical grade n Module level ster graduate ts of parameter and domain estim analysis, comparative analysis, ed learning outcomes dent masters the fundamental es f (type, number of weekly contact hours, le U (2) taught in: English l of assessment (type, scope, langua creditable for bonus) en examination (approx. 90 to 1 examination of one candidate e examination in groups (groups of ge of assessment: English ment offered: In the semester in ble for bonus ion of places nal information ad to in LPO I (examination regulations s degree (1 major) Mathematics s degree (1 major) Mathematics s degree (1 major) Mathematics	ial Statistics 1 coordinator f Studies Mathematik (Mathematics) Method of grading Numerical grade n Module level Other prerequisites ster graduate ts of parameter and domain estimates, tests for statistic analysis, comparative analysis, statistical product te ed learning outcomes dent masters the fundamental statistical methods for S (type, number of weekly contact hours, language — if other than Gerr U (2) taught in: English I of assessment (type, scope, language — if other than German, e rereditable for bonus) en examination (approx. 90 to 120 minutes, usually 0 examination of one candidate each (approx. 20 minutes examination in groups (groups of 2, 15 minutes per ca ge of assessment: English ment offered: In the semester in which the course is ble for bonus ion of places nal information ad s degree (1 major) Mathematics International (2021) s degree (1 major) Mathematics International (2021) s degree (1 major) Mathematics International (2021) s degree (1 major) Mathematics International (2022)	ial Statistics 1 Module offered by is coordinator Institute of Mathematik (Mathematics) Institute of Mathematik (mathematics) Method of grading Only after succ. compl. of module(s) numerical grade n Module level Other prerequisites ster graduate ts of parameter and domain estimates, tests for statistical estimates, distrianalysis, comparative analysis, statistical product testing, survey samplied learning outcomes determing outcomes determing outcomes determing outcomes determing outcomes determing outcomes determing outcomes determing outcomes eargersessment (type, scope, language if other than German, examination offered 10 (2) examination of one candidate each (approx. 20 minutes, usually chosen) or examination in groups (groups of 2, 15 minutes per candidate) ge of assessment: English ment offered: In the semester in which the course is offered and in the suble for bonus ion of places ad	

Module title			Abbreviation			
Lie Theory			10-M=ALTHin-152-n	101		
Module	e coord	inator		Module offered by		
Dean of	fStudi	es Mathematik (Mathen	natics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Linear Lie groups and their Lie algebras, exponential function, structure and classification of Lie algebras, classic examples, applications, e. g. in physics and control theory. Recommended previous knowledge: Basic knowledge of the contents of the modules "Functional Analysis" and "Introduction to Topology" is recom- mended. Furthermore, basic knowledge of the contents of the module "Introduction to Differential Geometry" is useful.						/" is recom-
		ning outcomes	<u> </u>			
	hese to	acquainted with the fu common problems, an				
Course	S (type, r	umber of weekly contact hours	, language — if other than Gei	man)		
V (4) + I Module		t in: English				
Method	d of ass	essment (type, scope, langu	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
module is	creditab	le for bonus)				
b) oral (c) oral (Langua	examir examin ge of a ment o	mination (approx. 90 to ation of one candidate ation in groups (groups ssessment: English ffered: In the semester bonus	each (approx. 20 minu of 2, 15 minutes per c	utes) or andidate)	ıbsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachir	ıg cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Physics International (2020) Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Physics International (2024) Master's with 1 major Mathematics International Master's with 1 major Mathemati						
(2022)				ECTS) Mathematics Internati	-	





Master's degree (1 major) Mathematics International (2025)

Module title					Abbreviation	
Numeric of Large Systems of Equations				10-M=ANGGin-152-m01		
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathema	itics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Recomr	nende	d previous knowledge:			onditioners, multigrid methods. es "Numerical Mathematics 1"	
and "Ni	umerica				nodule "Basics in Optimization"	
Intende	ed learr	ning outcomes				
		acquainted with the mos ent way to solve a given		for solving large sys	stems of equations, and knows	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) + I Module		t in: English				
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu if 2, 15 minutes per ca	tes) or andidate)	ıbsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
	Master's degree (1 major) Mathematics International (2015)					
	-	ee (1 major) Mathematics ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				

Module title			Abbreviation		
Basics in Optimization				10-M=AOPTin-152-m01	
Module	coord	inator		Module offered by	
Dean of	fStudi	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
					optimization, conditions for opti- eering sciences as well as econo-
Intende	ed leari	ning outcomes			
		nows the fundamental mo ecide which method is th			lge their strengths and weaknes-
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (4) + 1		t in. English			
		t in: English			the second s
module is	creditab	le for bonus)			t every semester, information on whether
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester
Allocati					
Additio	nal inf	ormation			
Worklo	ad				
300 h					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master's degree (1 major) Mathematics International (2015)					
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master's degree (1 major) Mathematics International (2025)					

Module title					Abbreviation
Control Theory					10-M=ARTHin-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten					
bility, b	asics i	n optimal control.	theory: stability, cont	rollability and obser	vability, state feedback and sta-
		d previous knowledge: lge of the contents of the	module "Ordinary Di	fferential Equations'	' is useful.
		ning outcomes		,	
blish a	connec				theory. He/She is able to esta- It the interactions of geometry
Course	S (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V (4) + I Module		t in: English			
		e ssment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups o ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	tes) or andidate)	ibsequent semester
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
300 h					
Teachir	ng cycl	e			
Referre	d to in	LPOI (examination regulations	for teaching-degree progra	mmes)	
Module	annea	irs in			
		ee (1 major) Mathematics	International (2015)		
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master'	Master's degree (1 major) Mathematics International (2025)				

Module title					Abbreviation	
Stochastic Models of Risk Management					10-M=ASMRin-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
res, val la, mod estimat series a	ue at ri elling o es of s inalysis	sk, conditional value at r of functional interrelation hortfall measures, estima	isk, axiomatic of risk is, regression models ates of value at risk a al smoothing, predict	measures, modellin , basics in time serie nd conditional value ions and prediction	ent in auditing, shortfall measu- g of interdependencies, copu- es modelling, aggregated losses, e at risk, basics in empirical time domains, estimates of value at ls.	
Intende	ed learr	ning outcomes				
The stu	dent is	acquainted with the fund	damental methods of	f stochastic risk anal	lysis.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) + I Module		t in: English				
Method	l of ass	essment (type, scope, langua	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
· · · · · · · · · · · · · · · · · · ·		le for bonus)				
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachir	ng cycl	e				
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
Module						
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				

Module title					Abbreviation	
Stochastical Processes					10-M=ASTPin-152-m01	
Module c	coordin	ator		Module offered by		
Dean of S	Studies	Mathematik (Mathema	tics)	Institute of Mathem	atics	
ECTS N	Nethod	of grading	Only after succ. com	pl. of module(s)		
10 n	numeric	cal grade				
Duration	N	Aodule level	Other prerequisites			
1 semeste	er g	graduate				
Contents		, ,				
Markov c	hains,	queues, stochastic prod	cesses in C[0,1], Brov	vnian motion, Donsk	er's theorem, projective limits.	
		previous knowledge:	irod such as that acc	wired in the "Stocks	astics 1" module. Knowledge of	
		the module "Stochastic			istics 1 moutie. Knowledge of	
Intended	learnii	ng outcomes				
The stude	ent is a	cquainted with the fund	damental notions and	d methods of stocha	stical processes and can apply	
		al problems.				
		nber of weekly contact hours, la	anguage — if other than Ger	man)		
V (4) + Ü (Module ta		n: English				
Method o	of asses	ssment (type, scope, languag	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
module is cr						
		ination (approx. 90 to 12				
		tion of one candidate ea tion in groups (groups o		-		
		sessment: English	1 2, 15 minutes per co	anuluale)		
		ered: In the semester in	which the course is	offered and in the su	ıbsequent semester	
creditable	e for bo	onus				
Allocation	on of pla	aces				
Additiona	al infor	mation				
Workload	d					
300 h						
Teaching	g cycle					
Referred	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module a	appears	s in				
Master's	degree	e (1 major) Mathematics	International (2015)			
	-	e (1 major) Mathematics				
	-	e (1 major) Mathematics				
Master's	Master's degree (1 major) Mathematics International (2025)					

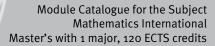
Module	title				Abbreviation
Τοροlοε	Topology				10-M=ATOPin-152-m01
Module	coord	inator		Module offered by	
Dean of	Studie	es Mathematik (Mathema	tics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Content	ts				
		opology, topological inva ng spaces.	ariants (e. g. fundame	ental group, connect	ion), construction of topological
Intende	d learr	ning outcomes			
		acquainted with the fund non problems.	damental results, the	orems and methods	in topology and is able to apply
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V (4) + ĺ Module	• •	t in: English			
		s essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
b) oral e c) oral e Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups o ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu f 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Workloa	ad				
300 h					
Teachin	ig cycl	e			
Referre	d to in	LPO I (examination regulations	for teaching-degree progra	mmes)	
Module appears in					
		ee (1 major) Mathematics	International (2015)		
	-	ee (1 major) Physics Inter			
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
	-	ee (1 major) Physics Inter			
Master'	Master's degree (1 major) Mathematics International (2025)				

Module title				Abbreviation	
Insuran	ice Mat	hematics 1			10-M=AVSMin-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
types o	f benef		tion principle, premiu	ım calculation, comr	bles, life table approximations, nutation functions, reserves and n.
Depend	ling on	d previous knowledge: the content, basic and a of doubt, it is recomme			of statistics or stochastics is re-
Intende	ed learr	ning outcomes			
		acquainted with the fund actical problems.	damental notions and	d methods of life ins	urance mathematics and can ap-
Courses	S (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V (4) + Í Module		t in: English			
		essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups o ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	tes) or andidate)	ıbsequent semester
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
300 h					
Teachir	ng cycl	9			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
Module					
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			

Module title					Abbreviation	
Time Series Analysis					10-M=AZRAin-222-m01	
Module	e coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathema	tics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	ıpl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
Recom Basic k	mende nowlec	d previous knowledge:	ired, such as that acc	quired in the "Stocha	rocesses, Box-Jenkins method. astics 1" module. Knowledge of	
Intende	ed learn	ning outcomes				
	dent is	-	damental methods of	f time series analysis	s and can apply them to practical	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) + Module		t in: English				
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) oral c) oral e Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu f 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	for teaching-degree progra	mmes)		
Module						
	-	ee (1 major) Mathematics				
Master's degree (1 major) Mathematics International (2025)						

Module title Abbreviation							
Number Theory					10-M=AZTHin-152-n	101	
Module	coord	inator		Module offered by			
Dean of	fStudie	es Mathematik (Mathem	natics)	Institute of Mathem	atics		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
10	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	graduate					
Conten	ts						
applica overvie Recomr Basic k	tions to w of th mendeo nowled	etic functions and their o prime number distribu e development of mode d previous knowledge: lge of algebra and num , "Introduction to Numb	ition and diophantine rn number theory. per theory is assumed,	equations; discussions, such as can be acqu	on of the Riemann hy	ypothesis,	
	-	ning outcomes					
The stu structur	dent is res in n	acquainted with the fu umber theory and know evelopments in number	s methods for the sol				
Courses	S (type, n	umber of weekly contact hours	, language — if other than Ger	man)			
V (4) + Í Module		t in: English					
Method	l of ass	s essment (type, scope, langu	age — if other than German, o	examination offered — if no	t every semester, informati	on on whether	
module is	creditab	le for bonus)					
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to ation of one candidate ation in groups (groups ssessment: English ffered: In the semester bonus	each (approx. 20 minu of 2, 15 minutes per c	utes) or andidate)	ibsequent semester		
Allocati							
Additio	nal inf	ormation					
Worklo	ad						
300 h							
Teachir	ng cycl	e					
Referre	d to in	LPO I (examination regulatio	ns for teaching-degree progra	mmes)			
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	appea	irs in					
		ee (1 major) Mathematic	s International (2015)				
Master'	s degr	ee (1 major) Physics Inte	ernational (2020)				
	-	ee (1 major) Mathematio					
	-	ee (1 major) Mathematic					
	-	ee (1 major) Physics International		enerated 19-Apr-2025 • exam	reg data re-	page 26 / 117	
(2022)	an i majoi	matrematics methationat		ECTS) Mathematics Internati	-	puze 20 / 11/	

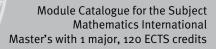




Master's degree (1 major) Mathematics International (2025)

Module title					Abbreviation		
Giovanni Prodi Lecture (Master) 10-M=A					10-M=AGPCin-152-r	n01	
Module	e coord	inator		Module offered by			
Dean o	f Studi	es Mathematik (Mather	natics)	Institute of Mathem	atics		
ECTS		od of grading	Only after succ. con	pl. of module(s)			
5		rical grade					
Duratio		Module level	Other prerequisites				
1 seme		graduate					
Conten		Sidduite					
		o a specialised topic in	mathomatics by an int	ornational oxport			
		ning outcomes					
		1	ndomental concente o	nd mathada af a can	tomporer recent	tania in ma	
themat	ics. He	s acquainted with the fu /She is able to establis applications in other s	h a connection betwee				
		number of weekly contact hour		rman)			
V (3) +							
		t in: English					
		Sessment (type, scope, lang ole for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether	
c) oral (Langua	examin ge of a ment o	nation of one candidate nation in groups (groups ssessment: English ffered: In the semester bonus	s of 2, approx. 10 minu	tes per candidate)	ıbsequent semester		
Allocat	ion of _l	places					
Additio	nal inf	ormation					
Worklo	ad						
150 h							
Teachi	ng cvcl	e					
	0 .)						
Referre	d to in	LPOI (examination regulati	ons for teaching-degree progra	mmes)			
				inines)			
Module	annes	ars in					
			cs International (2015)				
	Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Mathematics (2016)						
Master's degree (1 major) Mathematical Physics (2016)							
Master's degree (1 major) Computational Mathematics (2016)							
	Master's degree (1 major) Computational Mathematics (2019)						
	Master's degree (1 major) Mathematics (2019)						
	-	ee (1 major) Mathemati	-				
	-	ee (1 major) Mathemati					
	-	ee (1 major) Computati		2)			
waster	s degr	ee (1 major) Mathemati	CS (2022)				
	ith 1 majo	r Mathematics International		enerated 19-Apr-2025 • exam	-	page 28 / 117	
(2022)			cord Master (120	ECTS) Mathematics Internat	ional - 2022		

Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Master's degree (1 major) Mathematical Physics (2022) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Mathematics International (2025) Master's degree (1 major) Mathematical Data Science (2025)

Module title					Abbreviation
Selected Topics in Analysis					10-M=VANAin-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	itics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
with oth	her mat	ission of a specialised to thematical concepts. d previous knowledge:	pic in analysis taking	into account recent	developments and interrelations
Depend	ling on			from different areas	of analysis is required. In case of
Intende	ed learr	ning outcomes			
The stu comple			ed results in a selecte	ed topic in analysis,	and is able to apply these to
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (4) + l Module		t in: English			
			ge — if other than German, e	examination offered — if no	t every semester, information on whether
		le for bonus)			
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu if 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
300 h					
Teachir	ng cycl	9			
Referre	d to in	LPOI (examination regulations	for teaching-degree progra	mmes)	
Module					
		ee (1 major) Mathematics			
	-	ee (1 major) Mathematics ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			

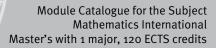
Module title					Abbreviation
Algebraic Topology					10-M=VATPin-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
spaces. Recomr	nende	d previous knowledge:			the topology of Euclidean e "Introduction to Topology".
		ning outcomes	·	•	
	-	acquainted with advance	ed results in algebrai	c topology.	
		umber of weekly contact hours, la			
V (4) + l	Ü (2)	t in: English			
			a if other than Corman of	warmination offered if no	t every semester, information on whether
		le for bonus)		zammation onered — If no	t every semester, information on whether
b) oral (c) oral (Langua)	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	ites) or andidate)	bsequent semester
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
300 h					
Teachir	ng cycl	9			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	rs in			
Master' Master'	Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Mathematics International (2021)				
	-	ee (1 major) Mathematics			
		gram Mathematics (2023) See (1 major) Mathematics			
master	Master's degree (1 major) Mathematics International (2025)				

Module	title				Abbreviation	
		cs in Financial Mathemat	ics		10-M=VFNMin-152-m01	
Module				Module offered by		
Dean of		es Mathematik (Mathema	-	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
10	1	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
of asse stochas Recomr Familia 1" is str	t pricin stic inte mendeo rity wit ongly r	g in discrete time for finit egration, stochastic differ d previous knowledge: h the contents of the mod ecommended.	e spaces, American rential equations and	out, Snell envelope, I Ito calculus, Black-	tingales, fundamental theorem stopping time, optimal stopping, Merton-Scholes model. al Mathematics" and "Stochastics	
		ning outcomes			S1	
		•			She gains the ability to work on er skills to complex problems.	
_		umber of weekly contact hours, l		•••	<u> </u>	
V (4) + Module		t in: English				
		e essment (type, scope, langua; le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per c	ites) or andidate)	ıbsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachir	ng cycl	9				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	irs in				
Master' Master'	Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Mathematics International (2025)					

Module title Abbreviation						
Groups and their Representations					10-M=VGDSin-152-1	n01
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mather	natics)	atics) Institute of Mathematics		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
the S-ri Recom	ngs of mende nowleo	d previous knowledge: lge of algebra is assum				
Intende	ed lear	ning outcomes				
The stu	dent m	asters advanced algeb questions in group theo				
Course	S (type, r	number of weekly contact hour	s, language — if other than Ger	man)		
V (4) + Module		t in: English				
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
b) oral c) oral (Langua	examir examin ge of a ment o	mination (approx. 90 to nation of one candidate ation in groups (groups ssessment: English ffered: In the semester bonus	each (approx. 20 minu 5 of 2, 15 minutes per c	utes) or andidate)	ıbsequent semester	
Allocat	ion of J	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachir	ng cycl	е				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
Module	e appea	ars in				
Master Master Master Master Master	Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Physics International (2020) Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Physics International (2024) Master's degree (1 major) Mathematics International (2025)					
Master's wi (2022)	ith 1 majo	r Mathematics International		enerated 19-Apr-2025 • exam DECTS) Mathematics Internat	_	page 33 / 117

Module	e title		Abbreviation						
Geome	trical N	lechanics	10-M=VGEMin-152-mo1						
Module coordinator				Module offered by					
Dean of Studies Mathematik (Mathema		natics)	atics) Institute of Mathematics						
ECTS	ECTS Method of grading		Only after succ. compl. of module(s)						
10	nume	rical grade							
Duratio	n	Module level	Other prerequisites						
1 semester graduate									
Contents									
The module builds on the topics covered in module 10-M=ADGM and discusses these in more detail: symplec- tic geometry, cotangent bundles and other examples of symplectic manifolds, symmetries and Noether theorem, phase space reduction, normal forms, introduction to Poisson geometry. Recommended previous knowledge: Advanced knowledge of differential geometry is required, such as can be acquired in the module "Differential Geometry". Knowledge of the contents of the module "Introduction to Topology" is also recommended. Knowled- ge of theoretical mechanics can also be useful.									
Intended learning outcomes									
The student is acquainted with selected advanced applications of differential geometry to geometric mechanics. He/She is able to establish a connection between his/her acquired skills and other branches of mathematics and questions in physics.									
Courses (type, number of weekly contact hours, language — if other than German)									
V (4) + Ü (2) Module taught in: English									
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)									
 a) written examination (approx. 90 to 120 minutes, usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, 15 minutes per candidate) Language of assessment: English Assessment offered: In the semester in which the course is offered and in the subsequent semester creditable for bonus 									
Allocation of places									
Additio	nal info	ormation							
Worklo	ad								
300 h									
Teaching cycle									
Referred to in LPO I (examination regulations for teaching-degree programmes)									
Module appears in									
Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Physics International (2020) Master's degree (1 major) Mathematics International (2021) Master's with 1 major Mathematics International (2022) Master's with 1 major Mathematics International JMU Würzburg • generated 19-Apr-2025 • exam. reg. data re-									
(2022)	an i major			ECTS) Mathematics Internati	-	Pube 24 / 11/			





Master's degree (1 major) Physics International (2024) Master's degree (1 major) Mathematics International (2025)

Module	title		Abbreviation						
Industr	ial Stat	tistics 2			10-M=VISTin-152-m01				
Module	coord	inator		Module offered by					
Dean of	f Studie	es Mathematik (Mathema	atics)	Institute of Mathematics					
ECTS	Metho	od of grading	Only after succ. compl. of module(s)						
10	nume	rical grade							
Duration		Module level	Other prerequisites						
1 semester graduate									
Contents									
Linear models, regression analysis, nonlinear regression, experimental design, basics in time series model- ling, basics in empirical time series analysis, methods of exponential smoothing, predictions and prediction do- mains, statistical process monitoring.									
Intended learning outcomes									
The student masters advanced statistical methods for industrial applications.									
Courses (type, number of weekly contact hours, language — if other than German)									
V (4) + Ü (2) Module taught in: English									
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)									
a) written examination (approx. 90 to 120 minutes, usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, 15 minutes per candidate) Language of assessment: English Assessment offered: In the semester in which the course is offered and in the subsequent semester creditable for bonus									
Allocation of places									
Additio	nal inf	ormation							
Worklo	ad								
300 h									
Teachir	ng cycl	e							
Referred to in LPO I (examination regulations for teaching-degree programmes)									
Module appears in									
Master's degree (1 major) Mathematics International (2015)									
Master's degree (1 major) Mathematics International (2021)									
Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Mathematics International (2025)									
Master's degree (1 major) Mathematics International (2025)									

Module title Abbreviation				Abbreviation	
Field Arithmetics					10-M=VKARin-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	ntics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten					
ber the	ory, e. g		irreducibility theorer		n the aim of application in num- nomials (e. g. Calitz-Wan-conjec-
	nowlec		l, such as can be acq	uired in the module	s "Introduction to Algebra" and
Intende	ed learr	ning outcomes			
		asters advanced algebra questions in algebra and			the ability to work on contempo- ems.
Course	S (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V (4) + I Module		t in: English			
		s essment (type, scope, languag le for bonus)	ge — if other than German, e	xamination offered — if no	t every semester, information on whether
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups o ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	tes) or andidate)	ıbsequent semester
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
300 h					
Teachir	ng cycl	9			
Referre	d to in	LPO I (examination regulations	for teaching-degree progra	mmes)	
		vo in			
Module			International (as :-)		
	-	ee (1 major) Mathematics ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master'	s degre	ee (1 major) Mathematics	International (2025)		

Module title				Abbreviation		
Numer	ic of Pa	rtial Differential Equat	ions		10-M=VNPEin-152-r	n01
Module coordinator				Module offered by		
Dean o	of Studi	es Mathematik (Mathe	matics)	Institute of Mathem	natics	
ECTS	1	od of grading	Only after succ. con			
10		rical grade				
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
(numer discon Recom	rical me tinuous mende	ethods for elliptic, para 5 Gelerkin finite elemer d previous knowledge:		artial differential equ ences and finite volu	uations; finite elemen ume methods).	nts method,
			unctional analysis and unctional Analysis" an			an be acqui-
Intend	ed lear	ning outcomes				
The stu	udent is	acquainted with adva	nced methods for discr	etising partial differe	ential equations.	
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	man)		
V (4) + Module		t in: English				
			uage — if other than German,	examination offered — if no	nt even comester informati	ion on whether
		le for bonus)	uage – ii other than German,		st every semester, mormati	on on whether
b) oral c) oral Langua Assess	examir examin age of a	nation of one candidate ation in groups (group ssessment: English ffered: In the semester	o 120 minutes, usually e each (approx. 20 minu s of 2, 15 minutes per c in which the course is	ites) or andidate)	ubsequent semester	
Allocat	ion of j	olaces				
	-					
Additio	onal inf	ormation				
Worklo						
300 h						
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
Module	e appea	ars in				
Master	's degr	ee (1 major) Mathemat	cs International (2015)			
	-	ee (1 major) Physics Int				
	-	-	cs International (2021)			
	-		ics International (2022)			
		ee (1 major) Physics Int				
Master	's degr	ee (1 major) Mathemat	cs International (2025)			
Mactaria	ith a m - !	Mathomatics Interventional	18411 \875	ported to Apresso	rog data ra	nage 20 / ···-
Master's w (2022)	nii 1 majo	r Mathematics International		enerated 19-Apr-2025 • exam • ECTS) Mathematics Internat	-	page 38 / 117

Module	e title				Abbreviation
Selecte	ed Topi	cs in Optimization			10-M=VOPTin-152-mo1
Module	e coord	inator		Module offered by	1
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	natics
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
		s in optimization, e.g. in timization with differentia		semidefinite progran	ns, non-smooth optimization, ga-
Intende	ed lear	ning outcomes			
		acquainted with advanc research questions in co			He gains the ability to work on
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Gei	rman)	
V (4) + Module	• •	t in: English			
			ge — if other than German,	examination offered — if no	ot every semester, information on whether
		le for bonus)	an minutan unuallu	ahacan) ar	
		mination (approx. 90 to 1 lation of one candidate e			
c) oral o	examin	ation in groups (groups o		-	
		ssessment: English		offered and in the ev	
credita		ffered: In the semester in bonus	i which the course is	offered and in the st	ubsequent semester
Allocat					
Additio	nal inf	ormation			
Worklo	ad				
300 h					
Teachi	ng cvcl	e			
	<u> </u>				
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
Module	e appea	ars in			
		ee (1 major) Mathematics	International (2015)		
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master	's degr	ee (1 major) Mathematics	International (2025)		

Module title Abbreviation				Abbreviation		
Mathematical Statistics					10-M=VSTAin-222-m01	
Module coordinator				Module offered by		
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
crimina	nt fund	tion analysis, cluster ana		-	factorial variance analysis, dis- or analysis.	
Basic k the con	nowlec tents o	f the module "Stochastic			astics 1" module. Knowledge of	
		ning outcomes				
The stu probler		acquainted with the fund	damental methods in	statistical analysis	and can apply them to practical	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) + I Module		t in: English				
		e essment (type, scope, langua ₎ le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) oral	examin	nination (approx. 90 to 1 ation of one candidate e	ach (approx. 20 minu	ites) or		
		ation in groups (groups c	of 2, 15 minutes per ca	andidate)		
		ssessment: English ffered: In the semester in	which the course is	offered and in the su	Ibsequent semester	
credital						
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachir	ng cycl	9				
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
	-					
Module						
	-	ee (1 major) Mathematics				
Master's degree (1 major) Mathematics International (2025)						

Module	Module title Abbreviation						
Insurar	nce Ma	thematics 2			10-M=VVSMin-152-	m01	
Module	e coord	inator		Module offered by			
Dean o	f Studi	es Mathematik (Mather	natics)	Institute of Mathem	natics		
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
10	nume	rical grade					
Duratio	on	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
lives: n Markov ons, jo Recom Familia	nodern / chain int life mende irity wit	liscusses modern valua valuation in life insura models, Kolmogorov's policies. d previous knowledge: h the contents of the m ongly recommended.	nce mathematics, axio differential equations,	matic derivation of tl Thiele's differential	he product measure equations, numerica	approach, Il applicati-	
		ning outcomes					
The stu	ident is	acquainted with advar research questions in					
		number of weekly contact hours				problems.	
V (4) +	-			inany			
Module	e taugh	t in: English					
		sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether	
b) oral c) oral Langua Assess credita	examir examin ige of a ment o ble for		each (approx. 20 min 5 of 2, 15 minutes per c	utes) or andidate)	ıbsequent semester		
Allocat	ion of p	olaces					
 Additio	onal inf	ormation					
Worklo	ad						
300 h							
Teachi	ng cycl	е					
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	immes)			
Module	e appea	ars in					
	-	ee (1 major) Mathemati					
	-	ee (1 major) Mathemati					
	-	ee (1 major) Mathemati					
master	s uegr	ee (1 major) Mathemati	cs international (2025)				
Master's w (2022)	ith 1 majo	r Mathematics International		enerated 19-Apr-2025 • exam • ECTS) Mathematics Internat	-	page 41 / 117	

Module title Abbreviation						
Discret	e Math	ematics			10-M=VDIMin-152-r	n01
Module	e coord	inator		Module offered by	red by	
Dean o	f Studi	es Mathematik (Mather	natics)	Institute of Mathem	natics	
ECTS		od of grading	Only after succ. con			
5	1	rical grade				
Duratio		Module level	Other prerequisites			
		-	-	1		
1 seme		graduate				
Conten						
graph t	heory o	thods and results in a s or combinatorics)	elected field of discret	e mathematics (e. g.	coding theory, crypt	tograpny,
		d previous knowledge: lge of the contents of th	ne module "Introductio	n to Discrete Mather	matics" is required.	
		ning outcomes				
		acquainted with advar		ed topic in discrete r	mathematics	
		•		•	nathematics.	
		number of weekly contact hours	s, language — If other than Ge	rman)		
V (3) + Module	• •	t in: English				
		Sessment (type, scope, lang Ile for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informat	ion on whether
a) writt	en exa	mination (approx. 6o to	90 minutes, usually c	hosen) or		
		nation of one candidate				
		ation in groups (groups	s of 2, approx. 10 minu	tes per candidate)		
		ssessment: English	in which the second is	offerred and in the ev		
credita		ffered: In the semester bonus	In which the course is	offered and in the st	ibsequent semester	
Allocat						
Additio	onal inf	ormation				
	,					
Worklo	ad					
150 h						
Teachi	ng cycl	e				
		•				
Poforro	d to in	LPO I (examination regulation	and for toaching dogree progr	ummoc)		
Kelene				annes)		
Module	annes	ars in				
		ee (1 major) Mathemati	cs International (2015)			
	-					
	Master's degree (1 major) Physics International (2020) Master's degree (1 major) Quantum Engineering (2020)					
	-	ee (1 major) Mathemati				
	-	ee (1 major) Mathemati				
Master	's degr	ee (1 major) Quantum E	ngineering (2024)			
Master	's degr	ee (1 major) Physics Int	ernational (2024)			
Master	's degr	ee (1 major) Mathemati	cs International (2025)			
Master's w (2022)	ith 1 majo	r Mathematics International		enerated 19-Apr-2025 • exam DECTS) Mathematics Internat	-	page 42 / 117

	Module title Abbreviation			
Dynamical Systems			10-M=VDSYin-152-m01	
Module coordinator		Module offered by		
Dean of Studies Mathematik (Mathema	tics)	Institute of Mathem	atics	
ECTS Method of grading	Only after succ. com	pl. of module(s)		
5 numerical grade				
Duration Module level	Other prerequisites			
1 semester graduate				
Contents				
Fundamentals of dynamical systems, e. Recommended previous knowledge: Basic knowledge of the contents of the				
Intended learning outcomes				
The student masters the mathematical quality.	methods in the theor	ry of dynamic system	ns, and is able to analyse their	
Courses (type, number of weekly contact hours, la	anguage — if other than Ger	man)		
V (3) + Ü (1) Module taught in: English				
Method of assessment (type, scope, languag module is creditable for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
a) written examination (approx. 60 to 9 b) oral examination of one candidate ea c) oral examination in groups (groups o Language of assessment: English Assessment offered: In the semester in creditable for bonus	ach (approx. 15 minu f 2, approx. 10 minut	tes) or es per candidate)	ıbsequent semester	
Allocation of places				
Additional information				
Workload				
150 h				
Teaching cycle				
Referred to in LPO I (examination regulations	for teaching-degree progra	mmes)		
Module appears in				
Master's degree (1 major) Mathematics				
Master's degree (1 major) Mathematics Master's degree (1 major) Mathematics				
Master's degree (1 major) Mathematics				

Module title					Abbreviation	
Aspects of Geometry 10-M=VGEOin-152-m			10-M=VGEOin-152-m01			
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
5		rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
with ot Recom	her ma mende	thematical structures, e. d previous knowledge:	g. topological geome	tries, diagram geom	velopments and interrelations etries. Topology" is recommended.	
		ning outcomes			Topology is recommended.	
	dent is	acquainted with advanc	ed results in a select	ed field of geometry	and can apply his/her skills to	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
V (3) +	• •					
		t in: English				
		sessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
b) oral c) oral Langua	examir examin Ige of a ment o	mination (approx. 60 to 9 nation of one candidate e ation in groups (groups o ssessment: English ffered: In the semester in bonus	ach (approx. 15 minu of 2, approx. 10 minut	tes) or tes per candidate)	ıbsequent semester	
Allocat						
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachi	ng cycl	е				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	e appea	ars in				
	-	ee (1 major) Mathematics	-			
		ee (1 major) Mathematics				
	-	ee (1 major) Mathematics ee (1 major) Mathematics				
master	s uegi	ee (1 major) Mathematics	miemational (2025)			

Module title				Abbreviation	
Mathematical Continuum Mechanics					10-M=VKOMin-152-mo1
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
Recomr Basic k	nendeo nowled	ntial equations and/or va d previous knowledge: lge from the modules "Or recommended, as well as	dinary Differential Eq	uations" and "Introc	nuum mechanics. duction to Partial Differential
Intende	ed learr	ning outcomes			
		asters the mathematical application.	methods in mathema	atical continuum me	chanics and knows about their
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (3) + ĺ Module		t in: English			
Method	l of ass	essment (type, scope, langua	ge — if other than German, e	examination offered — if no	t every semester, information on whether
		le for bonus)			
b) oral (c) oral (Langua)	examin examin ge of a ment o	nination (approx. 60 to 9 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 15 minu of 2, approx. 10 minut	tes) or es per candidate)	ibsequent semester
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
150 h					
Teachir	ng cycl	9			
Referre	d to in	LPOI (examination regulations	for teaching-degree progra	mmes)	
Module	appea	rs in			
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master's degree (1 major) Mathematics International (2025)					

Module title Abbreviation				Abbreviation		
Mathematical Imaging					10-M=VMBVin-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
camera ra pictu	model res; al	s and camera calibration gorithms; module might a	, rigid and non-rigid r	egistration, reconsti	lementary projective geometry, ruction of 3D objects from came- methods and tomography.	
		d previous knowledge: Ige of functional analysis	, such as that taught	in the module "Func	tional Analysis", is recommen-	
Intende	ed learr	ning outcomes				
The stu fields o			methods in the theor	y of image processi	ng and knows about their main	
Courses	S (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)		
V (3) + Ü Module		t in: English				
		s essment (type, scope, languag le for bonus)	ge — if other than German, e	xamination offered — if no	t every semester, information on whether	
b) oral e c) oral e Langua	examin examin ge of a ment o	mination (approx. 60 to 9 nation of one candidate en ation in groups (groups o ssessment: English ffered: In the semester in bonus	ach (approx. 15 minu of 2, approx. 10 minut	tes) or es per candidate)	ıbsequent semester	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachin	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module						
	-	ee (1 major) Mathematics	-			
	-	ee (1 major) Mathematics ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				

Module title Abbreviation				Abbreviation
Selected Topi	cs in Mathematical Phys	ics		10-M=VMPHin-152-mo1
Module coordinator			Module offered by	
Dean of Studi	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS Meth	od of grading	Only after succ. com	pl. of module(s)	
10 nume	rical grade			
Duration	Module level	Other prerequisites		
1 semester	graduate			
Contents				
terial science Recommende Depending or	s, geometric field theory, d previous knowledge:	advanced topics in q dvanced knowledge f	uantum theory.	id dynamics, mathematical ma- of analysis is required. In case of
Intended lear	ning outcomes			
	•	•		She is able to establish a and questions in physics.
Courses (type,	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (4) + Ü (2) Module taugh	it in: English			
module is credital	ole for bonus)			t every semester, information on whether
b) oral examin c) oral examin Language of a	mination (approx. 90 to 1 nation of one candidate e nation in groups (groups o assessment: English offered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester
Allocation of	places			
Additional inf	ormation			
Workload				
300 h				
Teaching cycl	e			
Referred to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
Module appe	ars in			
	ree (1 major) Mathematics	International (2015)		
-	ree (1 major) Physics Inter			
-	ee (1 major) Mathematics			
-	ee (1 major) Mathematics			
	ee (1 major) Physics Inter			
Master's degr	ree (1 major) Mathematics	international (2025)		

Module title					Abbreviation
Selected Topics in Control Theory 10-M=VTRTin-152-mod			10-M=VTRTin-152-m01		
Module coordinator				Module offered by	
Dean o	f Studi	es Mathematik (Mathem	atics)	Institute of Mathem	atics
ECTS	Methe	od of grading	Only after succ. con	pl. of module(s)	
10		rical grade		•	
Duratio		Module level	Other prerequisites		
1 seme	ster	graduate			
Conten			1		
bilinea Recom	r syster mende	ms. d previous knowledge:			ntrol systems, controllability of ntrol Theory" is required.
		ning outcomes			
The stu	dent g				y. He/She masters advanced
Course	S (type, r	number of weekly contact hours,	language — if other than Ger	rman)	
V (4) + Module		t in: English			
			age — if other than German.	examination offered — if no	t every semester, information on whether
		ole for bonus)	,		, ,
		mination (approx. 90 to			
		nation of one candidate o nation in groups (groups		-	
		issessment: English	or 2, 15 minutes per c	anuluale)	
Assess	ment o	offered: In the semester i	n which the course is	offered and in the su	ubsequent semester
credita	ble for	bonus			
Allocat	ion of _l	places	_		
Additio	nal inf	ormation			
Worklo	ad				
300 h					
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regulation	ns for teaching-degree progra	mmes)	
Module	e appea	ars in			
Master	's degr	ee (1 major) Mathematic	s International (2015)		
	-	ee (1 major) Mathematic			
Master's degree (1 major) Mathematics International (2022)					
	Master's degree (1 major) Mathematics International (2025)				

Module title Abbreviation					Abbreviation
Inverse Problems 1					10-M=VIPRin-222-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
sation r Recomr	nethoo nendeo	ls, examples of ill-posed d previous knowledge:	problems.		egularisation, iterative regulari-
Basic k ded.	nowlec	lge of functional analysis	, such as that taught	in the module "Func	tional Analysis", is recommen-
Intende	ed learr	ning outcomes			
					ne can apply regularisation me- th selected inverse problems.
Course	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (3) + Í Module		t in: English			
		s essment (type, scope, langua; le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 60 to 9 lation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 15 minu of 2, approx. 10 minut	tes) or tes per candidate)	ıbsequent semester
Allocat					
Additio	nal inf	ormation			
Worklo	ad				
150 h					
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	ars in			
	-	ee (1 major) Mathematics			
Master'	Master's degree (1 major) Mathematics International (2025)				

Module title Abbreviation					Abbreviation
Module Theory					10-M=VMTHin-152-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
semi-si rems.	mple a				n and representations, simple, ion theorems, reduction theo-
	nowlec	lge of algebra is assumed	l, such as can be acq	uired in the modules	s "Introduction to Algebra" and
Intende	ed learr	ning outcomes			
The stu	dent m	asters mathematical met	hods in module theo	ry and is able to ana	llyse their quality.
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (3) + Module		t in: English			
		essment (type, scope, langua, le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
b) oral c) oral e Langua	examin examin ge of a ment o	mination (approx. 60 to 9 nation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 15 minu of 2, approx. 10 minut	tes) or es per candidate)	ibsequent semester
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
150 h					
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	for teaching-degree progra	mmes)	
Module					
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics ee (1 major) Mathematics			
	Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Mathematics International (2025)				

Module title					Abbreviation
Non-linear Analysis					10-M=VNANin-152-mo1
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	numei	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts				
Method	ls in no	onlinear analysis (e. g. top	oological methods, m	ionotony and variation	onal methods) with applications.
We reco	ommen	d previous knowledge: d basic knowledge of fur lules "Introduction to Fur			quations, such as can be acqui-
Intende	ed learr	ning outcomes			
		acquainted with the con cal problems.	cepts of non-linear a	nalysis, can compare	e them and assess their applica-
Course	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (3) + I					
		t in: English			
		s essment (type, scope, langua; le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
		nination (approx. 60 to 9 ation of one candidate e			
		ation in groups (groups c		-	
		ssessment: English		· · · · · ·	
Assessi		ffered: In the semester in bonus	which the course is o	offered and in the su	ibsequent semester
Allocati					
Additio	nal info	ormation			
Worklo	ad				
150 h					
Teachir	ng cycle	9			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	in			
	-	ee (1 major) Mathematics			
		ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
master	s aegre	ee (1 major) Mathematics	international (2025)		

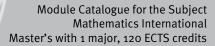
Module title Ab					Abbreviation
Optimal Control					10-M=VOSTin-152-m01
Module	coordi	nator		Module offered by	
Dean of	Studie	es Mathematik (Mathema	tics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	n	ical grade			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	graduate			
Conten	ts				
optimal	lity, me	thods for numerical solu		equations, theory of	optimal control, conditions for
We reco quired i	ommen in the n		Functional Analysis"	and "Ordinary Differ	equations, such as can be ac- ential Equations". Knowledge of
Intende	d learr	ing outcomes			
		acquainted with advance questions in continuous o		al control. He gains t	he ability to work on contempo-
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)	
V (3) + Ü Module		t in: English			
		essment (type, scope, languag le for bonus)	ge — if other than German, e	xamination offered — if no	t every semester, information on whether
b) oral e c) oral e Langua	examin examin ge of a ment of	nination (approx. 60 to 9 ation of one candidate e ation in groups (groups o ssessment: English ffered: In the semester in bonus	ach (approx. 15 minut f 2, approx. 10 minut	tes) or es per candidate)	ıbsequent semester
Allocati	ion of p	laces			
Additio	nal info	ormation			
Worklo	ad				
150 h					
Teachin	ig cycle	9			
Referre	d to in	LPO I (examination regulations	for teaching-degree program	mmes)	
Module					
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			

Module	e title				Abbreviation
Networ	ked Sy	vstems			10-M=VVSYin-152-m01
Module	e coord	inator		Module offered by	
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	natics
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts	<u>.</u>			
system Recom	s); ana mende	lysis of control-theoretica d previous knowledge:	al aspects (controllab	bility, accessibility, e	
		dge of the contents of the ning outcomes	module Ordinary D	inerential Equations	is useiul.
The stu	dent is				tems. He gains the ability to work
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (3) + Module		t in: English			
		Sessment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether
b) oral c) oral Langua	examir examin ge of a ment o	mination (approx. 60 to 9 nation of one candidate e nation in groups (groups o ssessment: English .ffered: In the semester in bonus	ach (approx. 15 minu of 2, approx. 10 minut	tes) or tes per candidate)	ubsequent semester
Allocat	ion of _l	places			
Additio	nal inf	ormation			
Worklo	ad				
150 h					
Teachi	ng cycl	e			
Referre	d to in	LPOI (examination regulation	s for teaching-degree progra	mmes)	
Module	e appea	ars in			
Master	's degr	ee (1 major) Mathematics	International (2015)		
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master	s degr	ee (1 major) Mathematics	international (2025)		

Module	title				Abbreviation	
Complex Geometry					10-M=VKGEin-152-m01	
Module coordinator				Module offered by		
Dean of	Studie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
calculu: Kähler),	s, com , differe		lex manifolds, metric	s on complex manif	these in more detail: Wirtinger olds (e. g. conformal, hermitian, nanifolds.	
		lge of the contents of the mplex Analysis" is recom		on to Complex Analy	sis" and " Complex Analysis" or	
Intende	d learr	ning outcomes				
					erential geometry. He is familiar methods independently.	
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)		
V (4) + Ü Module		t in: English				
		e ssment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) oral e c) oral e Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups o ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester	
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachin	ig cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module						
Master' Master'	s degre s degre	ee (1 major) Mathematics ee (1 major) Mathematics ee (1 major) Mathematics ee (1 major) Mathematics	International (2021) International (2022)			
	Master's degree (1 major) Mathematics International (2025)					

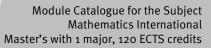
Partial	e title				Abbreviation	
Partial Differential Equations of Mathematical Physics					10-M=VPDPin-152-m01	
Modul	e coord	inator		Module offered by		
Dean o	of Studio	es Mathematik (Mathe	matics)	Institute of Mathematics		
ECTS	1	od of grading	Only after succ. con			
10		rical grade				
Duratio		Module level	Other prerequisites			
1 seme		graduate				
Conten	-					
examp ons an Recom	les; init d gener mende	ial and boundary value ralisations; Hilbert spa d previous knowledge:	e problems; well-posed ce methods; Sobolev s	and ill-posed proble paces and Fourier tra	and wave equation as standard ems; solution methods; extensi- ansforms. duction to Partial Differential	
			as basic knowledge of			
Intend	ed lear	ning outcomes				
equatio	ons, as	well as standard exam		al physics. He/She is	the theory of partial differential able to establish a connection ons in physics.	
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
V (4) + Module		t in: English				
	_		guage — if other than German.	examination offered — if no	ot every semester, information on whether	
		le for bonus)				
b) oral c) oral Langua Assess	examir examin age of a	ation of one candidate ation in groups (group ssessment: English ffered: In the semester	o 120 minutes, usually e each (approx. 20 minu s of 2, 15 minutes per c r in which the course is	utes) or andidate)	ubsequent semester	
	ion of p					
mocut						
•						
Additio	onat ini	ormation				
Worklo	ad					
300 h						
Teachi	ng cycl	e				
	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		
Referre						
Referre						
	e appea	ars in				
 Module			ics International (2015)			
 Module Master	's degr					
 Module Master Master	's degr 's degr	ee (1 major) Mathemat ee (1 major) Physics Int				
 Module Master Master Master	's degr 's degr 's degr	ee (1 major) Mathemat ee (1 major) Physics Int ee (1 major) Mathemat	ernational (2020)			
 Module Master Master Master Master	's degr 's degr 's degr 's degr	ee (1 major) Mathemat ee (1 major) Physics Int ee (1 major) Mathemat	ernational (2020) ics International (2021) ics International (2022)			





Master's degree (1 major) Mathematics International (2025)

Module	Module title Abbreviation					
Pseudo Riemannian and Riemannian Geometry 10-M=VP					10-M=VPRGin-152-r	no1
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathei	natics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10 numerical grade						
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
nian an map, Ja Laplace theory. Recom Advanc Geome	nd pseu acobi fi e opera mende ced kno try". Kr	uilds on the topics cov ido-Riemannian manifo elds, comparison theor tors, causal structure o d previous knowledge: wledge of differential g nowledge of the conten	olds, Levi-Civita connec ems in Riemannian geo f Lorenz manifolds, Eir geometry is required, su	tion and curvature, g ometry, submanifold ostein equations and uch as can be acquir	geodesics and the ex ls, integration, d'Aler l applications in gen red in the module "D	ponential mbert and eral relativity ifferential
		also recommended.				
The stu manifo	ldent is lds. He	acquainted with adva /She is able to establis l questions in physics.				
Course	S (type, r	number of weekly contact hour	s, language — if other than Ger	man)		
V (4) + Module		t in: English				
		sessment (type, scope, lang le for bonus)	uage — if other than German, o	examination offered — if no	ot every semester, informati	on on whether
b) oral c) oral (Langua	examir examin ge of a ment o	mination (approx. 90 to nation of one candidate ation in groups (group ssessment: English ffered: In the semester bonus	each (approx. 20 minu 5 of 2, 15 minutes per c	utes) or andidate)	ubsequent semester	
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	mmes)		
Module	e appea	ars in				
	-	ee (1 major) Mathemati ee (1 major) Physics Int				
Master's wi (2022)	ith 1 majo	r Mathematics International		enerated 19-Apr-2025 • exam • ECTS) Mathematics Internat		page 57 / 117

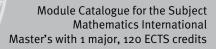


Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Physics International (2024) Master's degree (1 major) Mathematics International (2025)

Module	e title				Abbreviation
Functio	onal An	alysis			10-M=AFANin-152-m01
Module	e coord	inator		Module offered by	<u>.</u>
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	natics
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	graduate			
Conten	ts	<u>.</u>			
functio Recom	nal ana mende	lilbert spaces, bounded o alysis and applications to d previous knowledge: th the contents of the mod	other fields of math	ematics.	s, further contemporary topics in
		ning outcomes		ysis is strongly lett	innended.
The stu	dent is			nethods in a conter	porary field of functional analy-
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)	
V (4) + Module	• •	t in: English			
		s essment (type, scope, langua ole for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether
b) oral c) oral Langua	examir examin ge of a ment o	mination (approx. 90 to 1 nation of one candidate e nation in groups (groups o issessment: English iffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per c	utes) or andidate)	ubsequent semester
Allocat	ion of _l	places			
Additio	nal inf	ormation			
Worklo	ad				
300 h					
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	immes)	
Module	e appea	ars in			
Master	's degr	ee (1 major) Mathematics	International (2015)		
	-	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master	s degr	ee (1 major) Mathematics	international (2025)		

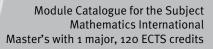
Module title Abbreviation							
Applied	l Differ	ential Geometry			10-M=VADGin-152-r	n01	
Module	coord	inator		Module offered by			
Dean of	fStudie	es Mathematik (Mathen	natics)	Institute of Mathematics			
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)			
10	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	graduate					
Content	ts						
tial geo timisati Recomr Advanc Geomet	The module builds on the topics covered in module 10-M=ADGM and discusses selected applications of differen- tial geometry, e. g. at the interface of control theory and mechanics (subriemannian geometry), in the smooth op- timisation on manifolds or applications in physics. Recommended previous knowledge: Advanced knowledge of differential geometry is required, such as can be acquired in the module "Differential Geometry". Knowledge of the contents of the modules "Applied Differential Geometry", "Geometric Mechanics",						
		annian and Riemannia ning outcomes	Geometry" and "Lie I	heory" is also recom	mended.		
The stu	dent is	acquainted with select ction between his/her a					
Courses	5 (type, n	umber of weekly contact hours	, language — if other than Ger	rman)			
V (4) + Ü Module		t in: English					
		e essment (type, scope, langu le for bonus)	uage — if other than German, o	examination offered — if no	t every semester, informati	on on whether	
b) oral e c) oral e Langua	examin examin ge of a ment o	nination (approx. 90 to ation of one candidate ation in groups (groups ssessment: English ffered: In the semester bonus	each (approx. 20 minu of 2, 15 minutes per c	utes) or andidate)	ıbsequent semester		
Allocati	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
300 h							
Teachin	ng cycl	e					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	appea	irs in					
		ee (1 major) Mathemati	cs International (2015)				
	-	ee (1 major) Mathemati					
	-	ee (1 major) Mathemati					
		ee (1 major) Mathematio					
Master's wit (2022)	th 1 major	Mathematics International		enerated 19-Apr-2025 • exam • ECTS) Mathematics Internat		page 60 / 117	

Module title Abbreviation						
Giovan	ni Proc	li Lecture Selected Top	ics (Master)		10-M=VGPSin-152-r	n01
Module	e coord	inator		Module offered by		
Dean o	of Studi	es Mathematik (Mathe	matics)	s) Institute of Mathematics		
ECTS	Meth	od of grading	Only after succ. con	pl. of module(s)		
10		rical grade		•		
Duratio		Module level	Other prerequisites			
1 seme		graduate				
Conten		3.44440				
-		o a specialised topic in	mathematics by an int	ernational expert		
		ning outcomes	in indire indires by an int	emational expert.		
			undamental concepts a	nd methods of a con	temporary research	tonic in ma-
themat	tics. He		sh a connection betwee			
Course	S (type, 1	number of weekly contact hour	s, language — if other than Ger	man)		
V (4) +						
Module	e taugh	t in: English				
		Sessment (type, scope, lang ole for bonus)	guage — if other than German, o	examination offered — if no	t every semester, informati	on on whether
Langua	age of a ment o	ssessment: English ffered: In the semester	s of 2, 15 minutes per c in which the course is		ıbsequent semester	
Allocat	ion of	places				
Additio	onal inf	ormation				
Worklo	ad					
300 h						
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
Module	e appea	ars in				
			ics International (2015)			
Master	's degr	ee (1 major) Mathemat	ics (2016)			
	Master's degree (1 major) Mathematical Physics (2016)					
Master's degree (1 major) Computational Mathematics (2016)						
	Master's degree (1 major) Computational Mathematics (2019)					
	Master's degree (1 major) Mathematics (2019)					
	-	ee (1 major) Mathemat	-			
	-	-	ics International (2021) onal Mathematics (202	ວ)		
	-	ee (1 major) Computati ee (1 major) Mathemat		<i>∠)</i>		
Master's w (2022)	ith 1 majo	r Mathematics International		enerated 19-Apr-2025 • exam • ECTS) Mathematics Internat	-	page 61 / 117



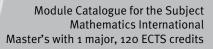
Master's degree (1 major) Mathematical Physics (2022) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Mathematics International (2025) Master's degree (1 major) Mathematical Data Science (2025)

Module title Abbreviation						
Giovan	ni Prod	i Lecture Advanced To	pics (Master)		10-M=VGPAin-152-r	n01
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathe	natics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10		rical grade				
Duratio		Module level	Other prerequisites			
1 seme		graduate				
Conten		Sidduite				
		o a specialised topic in	mathematics by an int	ornational oxport		
		ning outcomes				
themat	tics. He	acquainted with the fu /She is able to establis l applications in other :	sh a connection betwee			
Course	S (type, r	number of weekly contact hour	s, language — if other than Ge	rman)		
V (4) +	Ü (2)					
Module	e taugh	t in: English				
Metho	d of ass	sessment (type, scope, lang	uage — if other than German,	examination offered — if no	ot every semester, informati	ion on whether
-	-	le for bonus) mination (approx. 90 to				
c) oral Langua	examin age of a sment o	ation of one candidate ation in groups (group ssessment: English ffered: In the semester bonus	s of 2, 15 minutes per c	andidate)	ubsequent semester	
Allocat	ion of _l	olaces				
Additio	onal inf	ormation				
Worklo	ad					
300 h						
-	ng cycl	e				
	3-)	-				
Referre	ad to in	LPOI (examination regulati	one for toaching dogroo progr	ammoc)		
Referre				unines)		
Modul	o 20002	are in				
	e appea	ee (1 major) Mathemat	cc International (2015)			
	-	-				
	Master's degree (1 major) Mathematics (2016) Master's degree (1 major) Mathematical Physics (2016)					
Master's degree (1 major) Mathematical Mysics (2016) Master's degree (1 major) Computational Mathematics (2016)						
Master	Master's degree (1 major) Computational Mathematics (2019)					
	-	ee (1 major) Mathemat	-			
	-	ee (1 major) Mathemat				
	-	ee (1 major) Mathemati				
	-	ee (1 major) Computati ee (1 major) Mathemati		22)		
Imaster	5 uegi	ce (I major) matrieniati	(2022)			
Master's w (2022)	ith 1 majo	r Mathematics International		enerated 19-Apr-2025 • exam DECTS) Mathematics Internat	-	page 63 / 117



Master's degree (1 major) Mathematical Physics (2022) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Mathematics International (2025)

Module title					Abbreviation			
Giovanni Prodi Lecture Modern Topics (Master)					10-M=VGPMin-152-	m01		
Module coordinator				Module offered by				
Dean of Studies Mathematik (Mathema			matics)	Institute of Mathematics				
ECTS Method of grading			Only after succ. compl. of module(s)					
10	1	rical grade						
Duratio		Module level	Other prerequisites					
1 seme		graduate						
Conten		Siddate						
		o a specialised topic in		ernational expert				
		ning outcomes						
		acquainted with the fu		nd mothods of a con	tomporany rosparch	tonic in ma		
themat	tics. He	/She is able to establis I applications in others	h a connection betwee					
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	man)				
V (4) +	Ü (2)							
Module	e taugh	t in: English						
		Sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether		
Langua Assess	age of a	ation in groups (group) ssessment: English ffered: In the semester bonus			ıbsequent semester			
Allocat	tion of p	olaces						
Additio	onal inf	ormation						
Worklo	ad							
300 h								
Teachi	ng cycl	e						
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	mmes)				
		•		-				
Module	e appea	ars in						
		ee (1 major) Mathemati	cs International (2015)					
Master's degree (1 major) Mathematics (2016)								
Master's degree (1 major) Mathematical Physics (2016)								
Master's degree (1 major) Computational Mathematics (2016)								
Master's degree (1 major) Computational Mathematics (2019)								
Master's degree (1 major) Mathematics (2019)								
Master's degree (1 major) Mathematical Physics (2020)								
	Master's degree (1 major) Mathematics International (2021)							
Master's degree (1 major) Computational Mathematics (2022)								
Imaster	Master's degree (1 major) Mathematics (2022)							
Master's with 1 major Mathematics International JMU Würzburg • generated 19-Apr-2025 • exam. reg. data re- page 65 (2022) cord Master (120 ECTS) Mathematics International - 2022 page 65						page 65 / 117		



Master's degree (1 major) Mathematical Physics (2022) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Mathematics International (2025)

Module	e title			Abbreviation		
Geometric Complex Analysis					10-M=VGFTin-211-m01	
Module coordinator				Module offered by		
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	natics	
ECTS		od of grading	Only after succ. com	pl. of module(s)		
10		rical grade				
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate	- · ·			
Conten	ts					
trics, q Recom	uasico mende	thods and results in geon nformal maps, harmonic d previous knowledge: lge of the contents of the	functions, biholomor	phic maps).	naps, conformal Riemannian me-	
		ning outcomes		In to complex Analys	is is leconinended.	
The stu able cla	dent is assify t	acquainted with fundam	general theories and		geometric complex analysis, is nnections of geometric complex	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	rman)		
V (4) + Module		t in: English				
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) oral c) oral Langua Assess	a) written examination (approx. 90 to 120 minutes, usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, 15 minutes per candidate) Language of assessment: English Assessment offered: in the semester in which the course is offered and in the subsequent semester creditable for bonus					
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module						
Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Mathematics International (2025)						

Module	e title				Abbreviation		
Selected Topics in Numerical and Applied Mathematics					10-M=VNAMin-211-m01		
Module coordinator				Module offered by			
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	atics		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
10		rical grade		• • • •			
Duratio		Module level	Other prerequisites	Other prerequisites			
1 seme	ster	graduate					
Conten	ts						
lopmer Recom Depend	nts and mende ding on	interrelations with other d previous knowledge:	mathematical conce	pts. from different areas	taking into account recent deve- of applied mathematics is requi-		
		ning outcomes					
		acquainted with advanc these to complex problen		ed topic in numerica	l or applied mathematics, and is		
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)			
V (4) + Module	• •	t in: English					
		sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
b) oral c) oral Langua	examir examin ge of a ment o	mination (approx. 90 to 1 nation of one candidate e ation in groups (groups c ssessment: English ffered: in the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	utes) or andidate)	ıbsequent semester		
Allocat	ion of p	olaces					
Additio	nat inf	ormation					
	- d						
Worklo 300 h	au						
-		<u>م</u>					
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	ars in					
	-	ee (1 major) Mathematics					
	Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Mathematics International (2025)						
Master	's degr	ee (1 major) Mathematics	international (2025)				

Module	e title				Abbreviation		
Cryptography/Coding Theory					10-M=VKRYin-211-m01		
Module coordinator				Module offered by	ed by		
Dean of	f Studie	es Mathematik (Mathema	atics)	Institute of Mathem	natics		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)			
10	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
rary coo Recom	des, bo mendeo nowlec	unds, network codes, co d previous knowledge: lge of algebra is assumed	nnections to cryptogr	raphy.	hannon, classical and contempo- s "Introduction to Algebra" and		
		ning outcomes					
The stu is able	dent is to clas	acquainted with fundam	nore general theories		coding theory and cryptography, he connections of coding theory		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)			
V (4) + Module		t in: English					
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
b) oral c) oral e Langua	a) written examination (approx. 90 to 120 minutes, usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, 15 minutes per candidate) Language of assessment: English Assessment offered: in the semester in which the course is offered and in the subsequent semester						
Allocat	ion of p	olaces					
Additio	nal info	ormation					
Worklo	ad						
300 h							
Teaching cycle							
-							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	rs in					
		ee (1 major) Mathematics	International (2021)				
Master's degree (1 major) Mathematics International (2022)							
Master	Master's degree (1 major) Mathematics International (2025)						

Module title					Abbreviation		
Computer Algebra					10-M=VCALin-211-m01		
Module coordinator				Module offered by			
Dean of	Studie	es Mathematik (Mathema	atics)	Institute of Mathem	atics		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
10	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	graduate					
Conten							
lynomia als, syn als, Grö Recomr	als over nbolic i bner b nendeo nowled	r finite fields; lattices, lat ntegration of rational fur asis, Buchberger's algori d previous knowledge: lge of algebra is assumed	tice basis reduction a octions; exact arithme thm, algorithms for p	and LLL-algorithm; fa etic with algebraic nu ermutation groups.	er theorem; factorisation of po- actorisation of rational polynomi- umbers; multivariate polynomi- s "Introduction to Algebra" and		
		ning outcomes					
The stu puter al		nows about the theoretic	al foundations and th	e possible applicati	ons of several methods in com-		
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V (4) + l Module		t in: English					
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
b) oral e c) oral e Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: in the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	tes) or andidate)	ıbsequent semester		
Allocati	ion of p	olaces					
Additio	nal info	ormation					
Worklo	ad						
300 h							
Teaching cycle							
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in							
	Master's degree (1 major) Mathematics International (2021)						
	Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Mathematics International (2025)						

Module title Abbreviation						
Algorithmic Number Theory 10-M=VAZTin-211-mo1					10-M=VAZTin-211-m01	
Module coordinator				Module offered by		
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. con	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts	5	L			
roots. P tic curv Recomr Basic k	Primalit e meth mendeo nowlec	y tests for Fermat and Me od, quadratic sieve meth d previous knowledge:	ersenne numbers, fac od), discrete logarith er theory is assumed,	torisation methods im. , such as can be acq	ts, computation of primitive (Pollard-Rho, (p-1)-method, ellip- uired in the modules "Introducti-	
		ning outcomes	······························			
The stu	dent ki		al foundations and th	ne possible applicati	ions of several methods in algo-	
-		umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) +	Ü (2)	t in: English				
		e ssment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether	
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: in the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per c	utes) or andidate)	ubsequent semester	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
			-			
Worklo	ad					
300 h						
Teaching cycle						
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	appea	irs in				
Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022) Master's degree (1 major) Mathematics International (2025)						

Module title					Abbreviation			
Algebraic Geometry 10-M=VAGEin-211-m01								
Module	e coord	inator		Module offered by				
Dean of Studies Mathematik (Mathemati			natics)	Institute of Mathematics				
ECTS Method of grading Only			Only after succ. cor	Dnly after succ. compl. of module(s)				
10	nume	rical grade						
Duratio	on	Module level	Other prerequisites	5				
1 seme	ster	graduate						
Conten	ts							
sors ar Bezout Recom	nd Riem 's theo mende	ojective space, affine ar nann-Roch theorem for rem; Grassmann and fl d previous knowledge: dge of algebra is assum	curves; genus, singula ag varieties; 27 lines ir	rities and Plücker for n a cubic surface.	mula; dual curve, du	ual surface;		
"Applie								
Intend	ed lear	ning outcomes						
classify	y these	s acquainted with funda results within more ge f mathematics.						
Course	S (type, 1	number of weekly contact hour	s, language — if other than Ge	rman)				
V (4) + Module		t in: English						
		s essment (type, scope, lang ble for bonus)	uage — if other than German,	examination offered — if no	ot every semester, informati	on on whether		
b) oral c) oral Langua	examir examir age of a ment o	mination (approx. 90 to nation of one candidate nation in groups (groups issessment: English iffered: in the semester bonus	each (approx. 20 min 5 of 2, 15 minutes per c	utes) or candidate)	ubsequent semester			
Allocat	ion of	places						
Additio	onal inf	ormation						
Worklo	ad							
300 h	-							
Teachi	ng cycl	e						
Referred to in LPO I (examination regulations for teaching-degree programmes)								
Module appears in								
Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022) exchange program Mathematics (2023) Master's degree (1 major) Mathematics International (2025)								
		× , ,	,	-				
Master's w (2022)	ith 1 majo	r Mathematics International		generated 19-Apr-2025 • exam o ECTS) Mathematics Internat		page 72 / 117		

Module title					Abbreviation	
Analytic Number Theory					10-M=AAZTin-222-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10		rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
on, sun	ns of tw	eta-function, Euler produ vo squares, exponential s d previous knowledge:		ries, prime number t	heorem in arithmetic progressi-	
Basic k "Introdi	nowlec uction t	lge of number theory and to Number Theory" and "I			an be acquired in the modules	
		ning outcomes				
The stu ted que			al methods in analytic	c number theory. The	ey are able to apply them to rela-	
Course	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (4) + I Module		t in: English				
		e essment (type, scope, langua ₎ le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester	
Allocat	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
300 h						
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	appea	irs in				
	-	ee (1 major) Mathematics				
Master'	Master's degree (1 major) Mathematics International (2025)					

Module title Abbreviation					Abbreviation	
Inverse Problems 2					10-M=VIP2in-222-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	undergraduate				
Conten	ts					
Recomr Basic k	nendeo	gularisation methods, sou d previous knowledge: lge of functional analysis s the contents of the moc	, such as that taught	in the module "Func	tions. tional Analysis", is recommen-	
		ning outcomes				
The stu They ha	dents ι ve the	understand the particular	al regularisation met	hods and to examine	now solution methods for those. It them with respect to stability	
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (3) + l Module		t in: English				
		e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) oral (c) oral (Langua)	examin examin ge of a ment o	nination (approx. 90 to 1 ation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	ites) or andidate)	ibsequent semester	
Allocati	ion of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
150 h	150 h					
Teaching cycle						
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
Module	appea	irs in				
	-	ee (1 major) Mathematics				
Master'	Master's degree (1 major) Mathematics International (2025)					

Module title					Abbreviation	
Selected Topics in Complex Analysis					10-M=VAFTin-222-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
analysi sis, app Recomr	s or op proxima mende	erator theory as well as e ation theory, the theory o d previous knowledge:	xemplary application f partial differential e	s of this, e.g. in fund quations or mathem		
		lge of the contents of the mplex Analysis" is recom		on to Complex Analy	sis" and " Complex Analysis" or	
Intende	ed learı	ning outcomes				
lar has	a famil		of holomorphic funct		omplex analysis and in particu- late the acquired skills to other	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
V (3) + Í Module		t in: English				
		essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
b) oral (c) oral (Langua	examin examin ge of a ment o	nination (approx. 90 to 1 lation of one candidate e ation in groups (groups c ssessment: English ffered: In the semester in bonus	ach (approx. 20 minu of 2, 15 minutes per ca	ites) or andidate)	ıbsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachir	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	appea	in in				
		ee (1 major) Mathematics				
Master's degree (1 major) Mathematics International (2025)						



Research in Groups and Seminars

(20 ECTS credits)

Module title					Abbreviation	
Research in Groups - Algebra					10-M=GALGin-152-m01	
Module	coord	inator		Module offered by		
Dean of	Studie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
10	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
puter al	gebra,	algebras, division rings,		tative algebra, differ	rential algebra, local fields, com-	
	nowlec		d, such as can be acq	uired in the module	s "Introduction to Algebra" and	
Intende	d learr	ning outcomes				
		ains insight into contemp eld and can apply them to		ems in algebra. He/S	he masters advanced techni-	
Courses	5 (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)		
V (2) + S Module		t in: English				
		s essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Langua Assessi	ge of a nent o	minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the su	ibsequent semester	
Allocati	on of p	olaces				
Additio	nal info	ormation				
Worklo	ad					
300 h						
Teachin	Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
		*				
Module Mostor			International (act-)			
	-	ee (1 major) Mathematics ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				

Module title					Abbreviation
Research in Groups - Discrete Mathematics10-M=GDIMin-152-mo1					
Module coordinator Module offere					1
Dean o	of Studi	es Mathematik (Mathem	atics)	Institute of Mathen	natics
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade			
Durati	on	Module level	Other prerequisites		
1 seme	ester	graduate			
Conter	nts				
Select	ed mod	ern topics in discrete ma	thematics.		
Intend	ed lear	ning outcomes			
		ains insight into contem es in this field and can ap			hematics. He/She masters advar
Course	es (type, r	number of weekly contact hours,	language — if other than Gei	rman)	
V (2) +	• •				
		t in: English	_		
		sessment (type, scope, langua ele for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether
•		o minutes)			
		ssessment: English ffered: In the semester ii	n which the course is	offered and in the s	ubsequent semester
	tion of				
		Jaces	-		
Additi	onal inf	ormation	-		
			-		
Worklo	oad				
300 h					
-	ing cycl	e			
		-			
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)	
			00		
Modul	e appea	ars in			
		ee (1 major) Mathematic	s International (2015)		
Maste	r's degr	ee (1 major) Mathematic	s International (2021)		
	-	ee (1 major) Mathematic			
Maste	r's degr	ee (1 major) Mathematic	s International (2025)		

Module title Abbreviation					Abbreviation				
Research in Groups - Dynamical Systems and Control Theory10-M=GDSCi					10-M=GDSCin-152-mo1				
Modul	e coord	inator		Module offer	ed by				
Dean o	of Studi	es Mathematik (Mathem	atics)	Institute of N	lathematics				
ECTS	Meth	od of grading	Only after succ. con	npl. of module	(s)				
10	nume	rical grade		-					
Durati		Module level	Other prerequisites						
1 seme	ester	graduate							
Conte	nts		1						
		ern topics in dynamical	systems and control t	heorv.					
		d previous knowledge:	,	,					
			ule "Mathematical Co	ontrol Theory"	or "Control Theory" is required.				
		ning outcomes							
	_		porary research probl	ems in dynam	ical systems and control theory. He/				
		dvanced techniques in							
Course	es (type, i	number of weekly contact hours,	language — if other than Ge	rman)					
V (2) +	S (2)								
Modul	e taugh	t in: English							
		sessment (type, scope, langu vle for bonus)	age — if other than German,	examination offere	d — if not every semester, information on whether				
talk (6	0 to 120	o minutes)							
		ssessment: English		66 I I					
		-	n which the course is	offered and in	the subsequent semester				
Alloca	tion of	places	_						
Additi	onal inf	ormation							
Workle	oad								
300 h			_						
Teachi	ing cycl	e							
Referr	ed to in	LPO I (examination regulation	ns for teaching-degree progra	ammes)					
Modul	e appea	ars in							
			s International (2015)						
	-				Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Mathematics International (2021)				
	Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022)								
Maste	r's degr	ee (1 major) Mathematic	s International (2022))					

Module title					Abbreviation	
Research in Groups - Complex Analysis					10-M=GCOAin-152-mo1	
Module	e coord	inator		Module offered by	<u> </u>	
Dean o	f Studi	es Mathematik (Mathem	atics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
10		rical grade		-		
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate				
Conten		3.44440	1			
geome Recom Depene	tric con mende ding on	nplex analysis, value dis d previous knowledge: the current focus of the	tribution theory).	om different areas o	ential theory, complex dynamics f analysis is required. Consultat	
		cturer at the beginning o	the course is recomi	mended.		
The stu	ident g				lysis. He/She masters advanced	
		number of weekly contact hours,	- · ·			
V (2) +						
• •	• •	t in: English				
		sessment (type, scope, langua le for bonus)	age — if other than German,	examination offered — if no	ot every semester, information on whether	
Langua	ige of a) minutes) ssessment: English ffered: In the semester ii	n which the course is	offered and in the s	ubsequent semester	
Allocat			-		,	
Additio	onal inf	ormation	-			
Worklo	ad					
300 h						
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	ammes)		
		-				
Module	e appea	urs in				
		ee (1 major) Mathematics	s International (2015)			
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
Master	's degr	ee (1 major) Mathematics	s International (2025))		

Module title					Abbreviation	
Research in Groups - Geometry and Topology					10-M=GGMTin-152-m01	
Module coordinator Module offere					y	
Dean c	of Studi	es Mathematik (Matl	nematics)	Institute of Mathe	matics	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conter	nts					
Selecte	ed mod	ern topics in geomet	ry and topology.			
Intend	ed lear	ning outcomes				
			temporary research probl d can apply them to comp		nd topology. He/She masters ad-	
Course	S (type, 1	number of weekly contact h	ours, language — if other than Ge	rman)		
V (2) +	• • •					
		t in: English				
		sessment (type, scope, l ble for bonus)	anguage — if other than German,	examination offered — if	not every semester, information on whether	
		o minutes)				
		ssessment: English	ter in which the course is	offered and in the	subcoquent comester	
	tion of			onereu anu în the	שמששלים	
Allocal		places				
	nalinf	ormation				
AUUIII						
 Worklo	ad					
	du					
300 h Teachi	ng cycl	0				
TEALIII	ing cycl	C				
Dofor	d to in					
Referre		LEVE (examination regu	lations for teaching-degree progra	unines)		
 Modul		arc in				
	e appea		atics International (2015)			
	-		anco miemalional (2015)			
Master	Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022)					
			atics International (2021)			

Module title					Abbreviation
Research in Groups - Mathematics in Context10-M=GMCXin-152-mo1					
Module	, ,				
Dean o	f Studi	es Mathematik (Math	ematics)	Institute of Mather	natics
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)	
10	nume	rical grade		-	
Duratio	on .	Module level	Other prerequisites	;	
1 seme	ster	graduate			
Conten	Its				
ven by the cor	a histo nectio	rical period, a geogra n of mathematics witl		ar field of mathemat	of the history of mathematics, gi- tics. Other possibilities arise from ia.
		ning outcomes			
			mension of mathematics		other cultural fields.
	-	number of weekly contact ho	urs, language — if other than Ge	rman)	
V (2) + Module		t in: English			
		eessment (type, scope, la le for bonus)	nguage — if other than German,	examination offered — if n	ot every semester, information on whether
Langua	age of a	o minutes) ssessment: English ffered: In the semeste	er in which the course is	offered and in the s	ubsequent semester
Allocat					
Additio	onal inf	ormation			
Worklo	ad				
300 h					
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regula	tions for teaching-degree progra	ammes)	
Module	e appea	ars in			
	-		itics International (2015)		
	-		tics International (2021)		
	-		tics International (2022)		
master	saegr	ee (1 major) Mathéma	tics International (2025))	

Module	e title	Abbreviation				
Resear	Research in Groups - Mathematics in the Sciences 10-M=GMSCin-152-mo1					
Module	Module coordinator Module offered by					
Dean o	f Studi	es Mathematik (Mathem	atics)	Institute of Mathe	ematics	
ECTS	Meth	od of grading	Only after succ. con	pl. of module(s)		
10	nume	rical grade		· · · · · · · · · · · · · · · · · · ·		
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its		•			
A mode	ern top	ic in mathematics in the	sciences.			
Basic k Equatio	nowled	d previous knowledge: dge from the modules "O recommended, as well a ning outcomes			oduction to Partial Differential s.	
		ains insight into contem nniques in this field and			cs in the sciences. He/She masters	
Course	S (type, r	number of weekly contact hours,	language — if other than Gei	rman)		
Metho	e taugh d of as:	t in: English s essment (type, scope, langua le for bonus)	age — if other than German,	examination offered — if	not every semester, information on whether	
Langua	age of a	o minutes) ssessment: English ffered: In the semester i	n which the course is	offered and in the	subsequent semester	
Allocat	ion of _l	olaces				
Additio	onal inf	ormation				
Worklo	ad					
300 h						
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulation	ns for teaching-degree progra	mmes)		
			00			
Module	e appea	ars in				
		ee (1 major) Mathematic	s International (2015)			
	-					
	Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022)					
Master	Aaster's degree (1 major) Mathematics International (2022) Aaster's degree (1 major) Mathematics International (2025)					

Module title Abbreviation					
Resear	rch in G	roups - Measure and Inte	gral		10-M=GMAlin-152-m01
Modul	e coord	linator		Module offered by	<u> </u>
		es Mathematik (Mathema	atics)	Institute of Mathem	natics
ECTS	1	od of grading	Only after succ. con		
10	1	rical grade			
Duratio		Module level	Other prerequisites		
1 seme		graduate			
Conter		Sidduite			
functio	ons and		cted applications, e.	g. product measures	me and measure, measurable s (with Fubini's theorem and the cal spaces.
Intend	ed lear	ning outcomes			
		ains insight into contemp ed techniques in this field			l integration theory. He/She ma- is.
Course	es (type, i	number of weekly contact hours, l	anguage — if other than Ger	rman)	
V (2) + Modul		ıt in: English			
		sessment (type, scope, langua ble for bonus)	ge — if other than German, o	examination offered — if no	ot every semester, information on whether
Langua	age of a	o minutes) Issessment: English Iffered: In the semester in	which the course is	offered and in the s	ubsequent semester
Allocat	tion of	places			
Additio	onal inf	ormation			
Worklo	oad				
300 h					
Teachi	ing cycl	e			
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Modul	e appea	ars in			
		ee (1 major) Mathematics	International (2015)		
	•	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master	r's degr	ee (1 major) Mathematics	International (2025)		

Module title					Abbreviation	
Research in Groups - Numerical Mathematics and Applied Analysis 10-M=GNMAin-152-m					10-M=GNMAin-152-mo1	
Module	e coord	inator		Module offere	d by	
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Ma	thematics	
ECTS	Methe	od of grading	Only after succ. con	pl. of module(s	s)	
10	nume	rical grade				
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		1			
		cs in numerical mathema	tics, applied analysis	or scientific co	mputing.	
Depen	ding on	d previous knowledge: the content, basic and a equired. In case of doubt			areas of analysis and/or numerical ma- ecturer.	
Intend	ed lear	ning outcomes				
		ains insight into a conten ers advanced techniques			ical mathematics or applied analysis. omplex problems.	
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)		
Metho module is talk (60 Langua	d of ass creditation to to 120 age of a	ole for bonus) 5 minutes) 1ssessment: English			— if not every semester, information on whether	
Allocat			i which the course is		ne subsequent semester	
Additio	nal inf	ormation				
Worklo	ad		·			
300 h						
Teachi	ng cycl	e				
Referre	ed to in	LPOI (examination regulation	s for teaching-degree progra	mmes)		
			0	,		
Module	e appea	ars in				
		ee (1 major) Mathematics	International (2015)			
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
Master	's degr	ee (1 major) Mathematics	International (2025)			

Module title Abbreviation					Abbreviation	
Research in Groups - Robotics, Optimization and Control Theory10-M=GROCin-152-mo1					10-M=GROCin-152-mo1	
Modul	le coord	inator		Module offer	ed by	
Dean o	of Studi	es Mathematik (Mathema	atics)	Institute of N	lathematics	
ECTS	Meth	od of grading	Only after succ. con	npl. of module	(s)	
10	nume	rical grade		-		
Durati	on	Module level	Other prerequisites			
1 seme	ester	graduate				
Conte	nts					
Select	ed mod	ern topics in robotics, op	timisation and contro	ol theory.		
		d previous knowledge: the contents of the modu	ule "Mathematical Co	ntrol Theory"	or "Control Theory" is required.	
	_	ning outcomes		,	, ,	
			orary research probl	ems in robotio	s, optimization and control theory. He/	
		dvanced techniques in t				
Course	es (type, r	number of weekly contact hours, l	language — if other than Ge	man)		
V (2) +	- S (2)					
Modul	le taugh	t in: English				
		sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offere	d — if not every semester, information on whether	
		o minutes)				
		ssessment: English	which the course is	offorod and in	the subsequent semester	
				onereu anu m	the subsequent semester	
Alloca	tion of _l	places				
Additi	onal inf	ormation				
Workl	oad					
300 h						
Teach	ing cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
	le appea					
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
Maste	r's degr	ee (1 major) Mathematics	s International (2025)			

Module title					Abbreviation	
Research in Groups - Time Series Analysis					10-M=GTSAin-152-m01	
Module	e coord	inator		Module offered by	y	
Dean o	f Studi	es Mathematik (Mathe	matics)	Institute of Mathe	ematics	
ECTS	Methe	od of grading	Only after succ. con	npl. of module(s)		
10	nume	rical grade		-		
Duratio		Module level	Other prerequisites	6		
1 seme	ster	graduate				
Conten	ts		Į			
Selecte	d mod	ern topics in time serie	s analysis			
Basic k the cor	nowled				hastics 1" module. Knowledge of	
			mporary research probl	ems in time series	analysis. He/She masters advan-	
			apply them to complex			
Course	S (type, r	number of weekly contact hour	s, language — if other than Ge	rman)		
V (2) +	S (2)					
Module	e taugh	t in: English				
		Sessment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if	not every semester, information on whether	
Langua	ige of a	o minutes) Issessment: English Iffered: In the semester	in which the course is	offered and in the	subsequent semester	
Allocat						
Additio	onal inf	ormation				
Worklo	ad					
300 h						
Teachi	ng cvcl	e				
	0.95					
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		
Module	anne	ars in				
			ics International (2015)			
	-					
	Aaster's degree (1 major) Mathematics International (2021)					
	laster's degree (1 major) Mathematics International (2022) laster's degree (1 major) Mathematics International (2025)					

Module title Abbreviation					Abbreviation		
Research in Groups - Statistics					10-M=GSTAin-152-m01		
Module	coord	inator		Module offered by			
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
10	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
Recom Basic k the con	nende nowlec tents c		s 2" is also recomme	nded. Depending or	astics 1" module. Knowledge of 1 the content of the course, other 1 ded.		
Intende	ed learı	ning outcomes					
		ains insight into contemp eld and can apply them to		ems in statistics. He,	/She masters advanced techni-		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V (2) + 2 Module		t in: English					
		s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
Langua	ge of a	o minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the su	ıbsequent semester		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
300 h							
Teachir	ng cycl	e					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module							
	-	ee (1 major) Mathematics					
	-	ee (1 major) Mathematics ee (1 major) Mathematics					
	-	ee (1 major) Mathematics					

Module title Abbreviation					Abbreviation		
Research in Groups - Number Theory					10-M=GNTHin-152-m01		
Module	coord	inator		Module offered by			
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
10	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
Recomr Basic k	nende nowlec	d previous knowledge:	er theory is assumed,	such as can be acq	ar forms, diophantine analysis). uired in the modules "Introducti-		
Intende	ed leari	ning outcomes					
	-	ains insight into contemp field and can apply them	<i>i</i> .		. He/She masters advanced tech-		
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V (2) + S Module		t in: English					
		s essment (type, scope, langua; le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
Langua	ge of a	o minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the su	ıbsequent semester		
Allocat	ion of p	olaces					
Additio	nal inf	ormation					
Worklo	ad						
300 h							
Teachir	ng cycl	e					
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	Module appears in						
Master'	s degr	ee (1 major) Mathematics	International (2015)				
	-	ee (1 major) Mathematics					
	-	ee (1 major) Mathematics					
master	Master's degree (1 major) Mathematics International (2025)						

Module title Abbreviation						
Resear	Research in Groups - Control Theory of Quantum Mechanical Systems 10-M=GCQSin-152-mo1					
Module	e coord	inator		Module offere	d by	
Dean o	f Studi	es Mathematik (Math	ematics)	Institute of Ma	athematics	
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)	
10	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	Its					
Selecte	ed mod	ern topics in control t	theory of quantum mech	anical systems.		
Intend	ed lear	ning outcomes				
	•	-			heory of quantum mechanical sy- em to complex problems.	
Course	S (type, r	number of weekly contact ho	ours, language — if other than Ge	rman)		
V (2) +	S (2)					
Module	e taugh	t in: English				
		sessment (type, scope, la ole for bonus)	nguage — if other than German,	examination offered	— if not every semester, information on whether	
talk (60	o to 120	o minutes)				
-	-	ssessment: English		- 66		
			er in which the course is	offered and in t	he subsequent semester	
Allocat	ion of j	places				
 A						
Additio	nat inf	ormation				
 \\\\o_= -	ad					
Worklo	Dad					
300 h						
Teachi	ing cycl	e				
 Doform	d to in		attende forste soldte of			
		LFUI (examination regul	ations for teaching-degree progra	immes)		
 Maduli						
Module			atics International (as)			
	-		atics International (2015) atics International (2021)			
	-		atics International (2022)			
	- U-	. , ,	· · · · · · · · · · · · · · · · · · ·			

Module title Abbreviation					Abbreviation
Research in Groups - Differential Geometry10-M=GDGEin-152-m01					
Module	e coord	inator		Module offered by	
Dean o	f Studi	es Mathematik (Mathe	matics)	Institute of Mather	natics
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)	
10	nume	rical grade			
Duratio		Module level	Other prerequisites	5	
1 seme	ster	graduate			
Conten	ts				
Selecte	ed mod	ern topics in differenti	al geometry.		
Advano Geome "Pseud	ced kno try". Kr lo-Riem	nowledge of the conter annian and Riemannia	geometry is required, s	olied Differential Geo	red in the module "Differential ometry", "Geometric Mechanics", nmended.
Intend	ed lear	ning outcomes			
			mporary research prob apply them to complex		Geometry. He/She masters advan
Course	S (type, r	number of weekly contact hou	rs, language — if other than Ge	erman)	
V (2) + Module	• •	t in: English			
		eessment (type, scope, lan le for bonus)	guage — if other than German,	examination offered — if n	ot every semester, information on whether
Langua	age of a	o minutes) ssessment: English ffered: In the semeste	r in which the course is	offered and in the s	ubsequent semester
Allocat	ion of p	olaces			
Additio	onal inf	ormation			
Worklo	ad				
300 h					
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulat	ions for teaching-degree progr	ammes)	
Module	e appea	urs in			
Master Master	's degr 's degr	ee (1 major) Mathemat ee (1 major) Mathemat	ics International (2015) ics International (2021) ics International (2022) ics International (2025))	

Module title Abbreviation						
Resear	rch in G	roups - Deformation Qu	antization		10-M=GDFQin-152-m01	
Modul	e coord	inator		Module offered	i by	
Dean c	of Studi	es Mathematik (Mathem	natics)	Institute of Ma	thematics	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade				
Duratio		Module level	Other prerequisites	;		
1 seme	ester	graduate				
Conter	nts					
Selecte	ed mod	ern topics in deformatio	n quantization.			
		d previous knowledge: the contents of the mod	lules "Differential Geo	metry" and "Geo	ometric Mechanics" is recommended.	
Intend	ed lear	ning outcomes				
The stu	udent g	ains insight into contem			tion Quantization. He/She masters	
advand	ced tec	hniques in this field and	can apply them to co	mplex problems	•	
Course	es (type,	number of weekly contact hours,	language — if other than Ge	rman)		
V (2) +	• •					
		t in: English				
		sessment (type, scope, langu ple for bonus)	age — if other than German,	examination offered -	 if not every semester, information on whether 	
-		o minutes) Issessment: English				
			n which the course is	offered and in t	he subsequent semester	
Allocat	tion of	places				
Additio	onal inf	ormation				
Worklo	bad					
300 h						
-	ng cyc	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Modul	e appe	ars in				
		ee (1 major) Mathematic	s International (2015)			
	-	-				
	Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022)					
Master	r's degr	ee (1 major) Mathematic	s International (2022))		

Module title Abbreviation						
Resear	Research in Groups - Non-linear Analysis 10-M=GNLAin-152-mo1					
Module	e coord	inator		Module offered by	,	
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mather		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)		
10		rical grade				
Duratio	•	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		L			
		ern topics in non-linear a	nalvsis.			
Depend doubt,	ding on it is rea	commended to consult th		from different areas	s of analysis is required. In case of	
		ning outcomes		· • • • •		
		ains insight into contemp es in this field and can ap			nalysis. He/She masters advan-	
		number of weekly contact hours, l	· · ·	•		
V (2) + Module	• •	t in: English				
		s essment (type, scope, langua ile for bonus)	ge — if other than German, o	examination offered — if n	ot every semester, information on whether	
Langua	ige of a	o minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the s	ubsequent semester	
Allocat	ion of	olaces				
Additio	nal inf	ormation				
Worklo	ad					
300 h						
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	ars in				
		ee (1 major) Mathematics	International (2015)			
Master's degree (1 major) Mathematics International (2021)						
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				

Module title Abbreviation					Abbreviation	
Resear	Research in Groups - Operator Algebras 10-M=GOPAin-152-mo1					
Modul	e coord	inator		Module offered	by	
Dean o	of Studi	es Mathematik (Mathe	ematics)	Institute of Math	nematics	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
10		rical grade		•		
Duratio		Module level	Other prerequisites	6		
1 seme	ster	graduate				
Conten	its		L			
Selecte	ed mod	ern topics in operator	algebras.			
stems" Intend	is reco ed lear	ommended. ning outcomes			a and Dynamics of Quantum Sy-	
technio	ques in	this field and can app	bly them to complex pro	blems.		
Course	S (type, 1	number of weekly contact hou	urs, language — if other than Ge	rman)		
V (2) + Module	• •	t in: English				
		Sessment (type, scope, lar ole for bonus)	nguage — if other than German,	examination offered —	if not every semester, information on whether	
Langua	age of a	o minutes) issessment: English iffered: In the semeste	er in which the course is	offered and in the	e subsequent semester	
Allocat	ion of	places				
Additio	onal inf	ormation				
Worklo	ad					
300 h						
Teachi	ng cvcl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	Module appears in					
			tics International (2015)			
Master's degree (1 major) Mathematics International (2013) Master's degree (1 major) Mathematics International (2021)						
Master	Master's degree (1 major) Mathematics International (2021) Master's degree (1 major) Mathematics International (2022)					
	's degr					

Module title Abbreviation					Abbreviation	
Semina	Seminar in Applied Differential Geometry 10-M=SADGin-152-mo1					
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathe	ematics)	Institute of Mather	natics	
ECTS	Metho	od of grading	Only after succ. cor	npl. of module(s)		
5		rical grade				
Duratio		Module level	Other prerequisites	5		
1 seme	ster	graduate				
Conten		3.44440				
		c in applied differenti	al geometry			
Advanc Geome "Pseud	ed kno try". Kr o-Riem	nowledge of the conte annian and Riemanni	geometry is required, s	olied Differential Geo	red in the module "Differential ometry", "Geometric Mechanics", nmended.	
Intende	ed lear	ning outcomes				
				•	omprehending and structuring of pate in a scientific discussion.	
Course	S (type, r	number of weekly contact hou	urs, language — if other than Ge	rman)		
S (2) Module	e taugh	t in: English				
		sessment (type, scope, lar le for bonus)	nguage — if other than German,	examination offered — if n	ot every semester, information on whether	
Langua	ige of a	o minutes) ssessment: English ffered: In the semeste	er in which the course is	offered and in the s	ubsequent semester	
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachi	ng cvcl	e				
Referre	d to in	LPO I (examination regula	tions for teaching-degree progr	ammes)		
				·/		
Module	annes	urs in				
			tics International (2015))		
	-		tics International (2021)			
	•		tics International (2022			
Master	Master's degree (1 major) Mathematics International (2025)					

Module title Abbreviation						
Semina	Seminar in Algebra 10-M=SALGin-152-mo1					
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathen	natics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
A mode	ern topi	c in algebra.				
Basic k "Applie	nowleo d Alge		d, such as can be acc	juired in the module	es "Introduction to Algebra" and	
	-		mporany receased to	nic. This includes of	omprehending and structuring of	
				•	ate in a scientific discussion.	
		number of weekly contact hours, l	· · -			
S (2)		· · · ·				
Module	e taugh	t in: English				
		sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if n	ot every semester, information on whether	
Langua	ge of a) minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the s	ubsequent semester	
Allocat						
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	e appea	urs in				
Master	's degr	ee (1 major) Mathematics	International (2015)			
	Master's degree (1 major) Mathematics International (2021)					
Master	's degr	ee (1 major) Mathematics	International (2022)			
Master	's degr	ee (1 major) Mathematics	International (2025)			

Module title Abbreviation						
Semina	Seminar in Dynamical Systems and Control 10-M=SDSCin-152-m01					
Modul	e coord	inator		Module offered by	1	
Dean o	of Studi	es Mathematik (Mathema	atics)	Institute of Mather	natics	
ECTS	1	od of grading	Only after succ. con	pl. of module(s)		
5	1	rical grade				
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate				
Conter	nts					
A mod	ern top	ic in dynamical systems a	ind control.			
		d previous knowledge:				
	_	the contents of the modu	ile "Mathematical Co	ntrol Theory" or "Co	ntrol Theory" is required.	
	-	ning outcomes				
					omprehending and structuring of ate in a scientific discussion.	
Course	S (type, 1	number of weekly contact hours, l	anguage — if other than Gei	man)		
S (2) Module	e taugh	t in: English				
		sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if n	ot every semester, information on whether	
		o minutes)				
		ssessment: English ffered: In the semester in	which the course is	offered and in the s	ubsequent semester	
Allocat	tion of	places				
Additio	onal inf	ormation				
Worklo	ad					
150 h						
Teachi	ng cycl	e				
Referre	Referred to in LPO I (examination regulations for teaching-degree programmes)					
	···					
Modul	e appea	ars in				
		ee (1 major) Mathematics	International (2015)			
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
Master	's degr	ee (1 major) Mathematics	International (2025)			

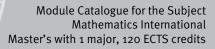
Module title Abbreviation						
Semina	Seminar in Complex Analysis 10-M=SCOAin-152-mo1					
Module	Module coordinator Module offered by					
Dean of	f Studi	es Mathematik (Mathema	atics)	Institute of Mather	natics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5		rical grade		•		
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		L			
Recom	mende nowled		modules "Introducti	on to Complex Anal	ysis" and " Complex Analysis" is	
		ning outcomes				
The stu	dent is	able to elaborate a conte			omprehending and structuring of bate in a scientific discussion.	
		number of weekly contact hours, l				
Method module is talk (60 Langua	d of ass creditab to 120 ge of a ment o	^{le for bonus)} 9 minutes) ssessment: English ffered: In the semester in			ot every semester, information on whether ubsequent semester	
Additio	nal inf	ormation				
		-				
Worklo	ad					
150 h						
Teachir	ıg cycl	e				
		-				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	immes)		
Module	appea	ars in				
Master Master Master	's degr 's degr 's degr	ee (1 major) Mathematics ee (1 major) Mathematics ee (1 major) Mathematics ee (1 major) Mathematics	International (2021) International (2022)			

Module	e title		Abbreviation		
Seminar in Financial and Insurance Mathematics 10-M=SFIMin-152-m01					10-M=SFIMin-152-m01
Module coordinator Module offered by					
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathe	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
5	1	rical grade		•	
Duratio		Module level	Other prerequisites		
1 seme	ster	graduate			
Conten			<u>I</u>		
		ic in financial and insura	nce mathematics		
Familia 1" is str Intendo	rity wit rongly ed lear	recommended. ning outcomes			ial Mathematics" and "Stochastics
					comprehending and structuring of pate in a scientific discussion.
Course	S (type, 1	number of weekly contact hours, l	anguage — if other than Ge	rman)	
Metho	d of as		ge — if other than German,	examination offered — if r	not every semester, information on whether
talk (60 Langua	o to 120 Ige of a	ole for bonus) o minutes) Issessment: English ffered: In the semester ir	which the course is	offered and in the s	subsequent semester
Allocat					
Additio	onal inf	ormation			
Worklo	ad				
150 h					
Teachi	ng cycl	e	-		
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	immes)	
Module	e appea	ars in			
		ee (1 major) Mathematics	International (2015)		
	-	ee (1 major) Mathematics			
Master	's degr	ee (1 major) Mathematics	s International (2022))	
Master	's degr	ee (1 major) Mathematics	International (2025)		

Module title					Abbreviation	
Seminar in Geometry and Topology					10-M=SGT0in-152-m01	
Module	e coord	inator		Module offered	by	
Dean o	f Studi	es Mathematik (Mather	natics)	Institute of Math	ematics	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
5	1	rical grade		•		
Duratio		Module level	Other prerequisites	6		
1 seme	ster	graduate	, <u>,</u>			
Conten	ts	0	<u>I</u>			
Recom Basic k	mende			ion to Differential	Geometry" and "Introduction to To-	
		ommended. ning outcomes				
The stu	ident is	able to elaborate a cor			comprehending and structuring of	
			<u>.</u>	· · ·	cipate in a scientific discussion.	
Course	S (type, 1	number of weekly contact hours	, language — if other than Ge	rman)		
S (2) Module	e taugh	t in: English	_			
		Sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered —	if not every semester, information on whether	
Langua	ige of a	o minutes) ssessment: English ffered: In the semester	in which the course is	offered and in the	e subsequent semester	
Allocat	ion of	olaces				
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	ammes)		
Module	e appea	ars in				
		a rs in ee (1 major) Mathemati	cs International (2015)	1		
Master	's degr		, J,			
Master Master	's degr 's degr	ee (1 major) Mathemati	cs International (2021))		

Module	e title				Abbreviation	
Giovanni Prodi Seminar (Master)					10-M=SGPCin-152-r	n01
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathem	atics)	Institute of Mathem	atics	
ECTS	1	od of grading	Only after succ. com			
	1	rical grade				
5 Duratio		Module level	Other prerequisites			
			1			
1 seme		graduate				
Conten						
A mode	ern top	ic in the research experti	se of the current hold	er of the Giovanni Pr	odi Chair.	
Intende	ed lear	ning outcomes				
		able to elaborate a cont the available literature, _l				
		number of weekly contact hours,				
S (2)		t in: English				
		sessment (type, scope, langua		wamination offered — if no	t ovoru comostor informati	on on whothor
		le for bonus)	age — Il other than German, e		tevely semester, mormati	on on whether
talk (60	. to 120	o minutes)	_			
		ssessment: English				
Assess	ment o	ffered: In the semester in	n which the course is	offered and in the su	ıbsequent semester	
Allocat	ion of _l	olaces				
Additio	onal inf	ormation				
Worklo	ad					
150 h			<u>.</u>			
-		-				
Teachi	ng cyci	e				
Referre	ed to in	LPO I (examination regulation	s for teaching-degree progra	mmes)		
Module	e appea	ars in				
Master	's degr	ee (1 major) Mathematic	s International (2015)			
Master	's degr	ee (1 major) Mathematic	s (2016)			
Master	's degr	ee (1 major) Economathe	ematics (2016)			
Master	's degr	ee (1 major) Mathematic	al Physics (2016)			
Master	's degr	ee (1 major) Computation	nal Mathematics (201	6)		
Master	's degr	ee (1 major) Computation	nal Mathematics (201	9)		
Master	's degr	ee (1 major) Mathematic	s (2019)			
Master	's degr	ee (1 major) Mathematic	al Physics (2020)			
Master	's degr	ee (1 major) Mathematic	s International (2021)			
Master	's degr	ee (1 major) Economathe	ematics (2021)			
Master	's degr	ee (1 major) Computation	nal Mathematics (202	2)		
Master	's degr	ee (1 major) Mathematic	s (2022)			
Master	's degr	ee (1 major) Mathematic	al Physics (2022)			
		ee (1 major) Mathematic				
Master's wi (2022)	ith 1 majo	r Mathematics International		enerated 19-Apr-2025 • exam ECTS) Mathematics Internat	-	page 101 / 117

Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Master's degree (1 major) Economathematics (2022) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Economathematics (2024) Master's degree (1 major) Mathematics International (2025) Master's degree (1 major) Mathematical Data Science (2025) Master's degree (1 major) Economathematics (2025)

Module title Abbreviation					Abbreviation	
Interdisciplinary Seminar					10-M=SIDCin-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
A mode	ern topi	c in mathematics with int	terdisciplinary aspec	ts.		
Intende	ed learr	ning outcomes				
					mprehending and structuring of ate in a scientific discussion.	
Course	S (type, n	umber of weekly contact hours, la	anguage — if other than Ger	man)		
S (2) Module	taugh	t in: English				
		e essment (type, scope, languag le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Langua	ge of a) minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the su	ibsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachir	ng cycl	9				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
Module	Module appears in					
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
master	Master's degree (1 major) Mathematics International (2025)					

Module title Abbreviation						
Semina	Seminar Mathematics in the Sciences 10-M=SMSCin-152-mo1					
Module	Module coordinator Module offered by					
Dean of	f Studi	es Mathematik (Mathema	atics)	Institute of Mathen	natics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade		· · · ·		
Duratio		Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts		L			
A mode	ern topi	c in mathematics in the s	sciences.			
Basic k Equatic	nowleo ons" is	recommended, as well as			duction to Partial Differential	
		ning outcomes				
					omprehending and structuring of ate in a scientific discussion.	
		number of weekly contact hours, l				
S (2) Module	e taugh	t in: English				
		sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if n	ot every semester, information on whether	
Langua	ge of a	o minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the s	ubsequent semester	
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachir	ıg cycl	e				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)		
			0			
Module	e appea	ırs in				
		ee (1 major) Mathematics	International (2015)			
	0	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
Master	's degr	ee (1 major) Mathematics	International (2025)			

Module	e title				Abbreviation
Seminar in Numerical Mathematics and Applied Analysis					10-M=SNMAin-152-m01
Module coordinator Module offered by					by
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Math	iematics
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)	
5	nume	rical grade			
Duratio		Module level	Other prerequisites	;	
1 seme	ster	graduate			
Conten		0	<u>I</u>		
A mode	ern topi	c in numerical mathemat	tics or applied analys	sis.	
Depend themat	ding on ics is re	equired. In case of doubt			eas of analysis and/or numerical ma- turer.
		ning outcomes			
					s comprehending and structuring of cipate in a scientific discussion.
		number of weekly contact hours, I		, ,	
S (2) Module	e taugh	t in: English			
		essment (type, scope, langua le for bonus)	ge — if other than German,	examination offered —	if not every semester, information on whether
Langua	ge of a	o minutes) ssessment: English ffered: In the semester ir	ו which the course is	offered and in the	e subsequent semester
Allocat	ion of j	olaces			
Additio	nal inf	ormation			
Worklo	ad				
150 h					
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	ammes)	
Module	e appea	ars in			
		ee (1 major) Mathematics	s International (2015)		
	0	ee (1 major) Mathematics			
	-	ee (1 major) Mathematics			
Master	's degr	ee (1 major) Mathematics	s International (2025))	

Module title Abbre					Abbreviation	
Seminar in Optimization					10-M=SOPTin-152-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathema	itics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	ts					
A mode	ern topi	c in optimisation.				
Intende	ed learı	ning outcomes				
					mprehending and structuring of ate in a scientific discussion.	
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2) Module	taugh	t in: English				
Method	l of ass		ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Langua	ge of a) minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the su	ibsequent semester	
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
150 h						
Teachir	ng cycl	e				
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
Module	appea	irs in				
Master'	Master's degree (1 major) Mathematics International (2015) Master's degree (1 major) Mathematics International (2021)					
		ee (1 major) Mathematics				
Master	s degr	ee (1 major) Mathematics	International (2025)			

Module title					Abbreviation	
Seminar in Statistics					10-M=SSTAin-152-m01	
Module	coord	inator		Module offered by		
Dean of	Studie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semes	ster	graduate				
Conten	ts					
Recomr Basic ki	nendeo				astics 1" module. Knowledge of 1 the content of the course, other	
		ge may also be helpful; c	onsultation with the	lecturer is recommer	nded.	
		ning outcomes				
					mprehending and structuring of ate in a scientific discussion.	
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
S (2) Module	taugh	t in: English				
		s essment (type, scope, langua; le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
		minutes)				
Langua	ge of a	ssessment: English ffered: In the semester in	which the course is	offered and in the su	ibsequent semester	
Allocati			which the course is			
Additio	nal info	ormation				
Workloa	ad					
150 h						
Teachin	ig cycl	9				
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)		
Module	appea	irs in				
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics ee (1 major) Mathematics				
master	Master's degree (1 major) Mathematics International (2025)					

Module title					Abbreviation	
Seminar in Non-linear Analysis					10-M=SNLAin-152-m01	
Module	e coord	inator		Module offered b)y	
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Math	ematics	
ECTS	Meth	od of grading	Only after succ. cor	npl. of module(s)		
5	nume	rical grade				
Duratio	on .	Module level	Other prerequisites	;		
1 seme	ster	graduate				
Conten	ts		Į.			
Recomi Depend	mende ding on			from different area	as of analysis is required. In case of	
		commended to consult th ning outcomes	e lecturer.			
			emporany research to	nic This includes	comprehending and structuring of	
			. ,	•	ipate in a scientific discussion.	
		number of weekly contact hours, l				
Method module is talk (60	d of ass creditat	t in: English sessment (type, scope, langua le for bonus) o minutes) ssessment: English	ge — if other than German,	examination offered — i	f not every semester, information on whether	
Assess	ment o	ffered: In the semester ir	which the course is	offered and in the	subsequent semester	
Allocat	ion of _l	olaces				
Additio	nal inf	ormation	-			
Worklo	ad					
150 h						
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulation	s for teaching-degree progra	ammes)		
Module	e appea	ars in				
	0	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics				
Master	's degr	ee (1 major) Mathematics	5 International (2025))		

Module title Abbreviation						
Seminar in Applied Mathematics					10-M=SAMAin-211-mo1	
Module	e coord	inator		Module offered by	<u> </u>	
		es Mathematik (Mathema	atics)	Institute of Mather	natics	
ECTS	1	od of grading	Only after succ. con	npl. of module(s)		
5		rical grade		•		
Duratio	on .	Module level	Other prerequisites			
1 seme	ster	graduate				
Conten	its	·				
A mode	ern top	ic in applied mathematics	5.			
Depen	ding or	d previous knowledge: the content, basic and a f doubt, it is recommende			of applied mathematics is requi-	
Intend	ed lear	ning outcomes				
			. ,	•	omprehending and structuring of ate in a scientific discussion.	
Course	S (type, 1	number of weekly contact hours, l	anguage — if other than Ge	rman)		
S (2) Module	e taugh	t in: English				
		Sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if n	ot every semester, information on whether	
Langua	age of a	o minutes) ssessment: English ffered: in the semester in	which the course is	offered and in the s	ubsequent semester	
Allocat						
Additio	onal inf	ormation				
Worklo	ad					
150 h	1					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulations	s for teaching-degree progra	ammes)		
Modul						
	-	ee (1 major) Mathematics				
	-	ee (1 major) Mathematics ee (1 major) Mathematics				
master	s uegi	ee (1 major) Mathematics	miemational (2025)	1		

Module title Abbreviation					
Research in Groups - Lie Theory					10-M=GLIEin-211-m01
Modul	e coord	inator		Module offered b	y
Dean c	f Studi	es Mathematik (Mather	natics)	Institute of Mathe	ematics
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
10	nume	rical grade			
Durati	on	Module level	Other prerequisites		
1 seme	ster	graduate			
Conter	Its	<u>.</u>			
Selecte	ed mod	ern topics in Lie Theory	•		
		d previous knowledge:	dulo "Lio theony" is rea	wired	
	_	the contents of the mo	une the theory is req	uneu.	
	-	ning outcomes			U. /Champatana a dur dur dur
		ains insight into conten eld and can apply them		ems in Lie Theory.	He/She masters advanced techni
		number of weekly contact hours		rman)	
V (2) +	_	tamber of weekly contact flours			
• •	• •	t in: English			
	_		uage — if other than German,	examination offered — if	not every semester, information on whether
		le for bonus)			
		o minutes)			
		ssessment: English		cc 1 1 1 1	
		ffered: in the semester	in which the course is	offered and in the	subsequent semester
Allocat	ion of _l	places			
Additio	onal inf	ormation			
Worklo	ad				
300 h					
Teachi	ng cycl	e			
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	immes)	
Modul	e appea	ars in			
		ee (1 major) Mathemati	cs International (2021)		
Master	's degr	ee (1 major) Mathemati	cs International (2022))	
Mactor	's dear	ee (1 maior) Mathemati	cs International (2025)		

Module title					Abbreviation	
Research in Groups - Applied Differential Geometry 10-M=GADGin-211-mo1						
Module coordinator Mod					lule offered by	
Dean o	f Studi	es Mathematik (Math	ematics)	Institute of Ma	thematics	
ECTS	Meth	od of grading	Only after succ. co	mpl. of module(s)	
10	nume	rical grade				
			Other prerequisite	requisites		
1 seme	ster	graduate				
Conten	Its					
Recom Advano al Geor	mende ced kno metry".	d previous knowledg wledge of differentia Knowledge of the co	l geometry is required, s	Introduction to To	equired in the module "Differenti- pology", "Geometric Mechanics",	
		ning outcomes			commended.	
The stu	ıdent g	ains insight into cont	emporary research prob field and can apply them		Differential Geometry. He/She ma- olems.	
		· ·	ours, language — if other than Ge	· · ·		
V (2) +	_	· · · · ·				
Module	e taugh	t in: English				
			nguage — if other than German	, examination offered -	 if not every semester, information on whether 	
talk (60 Langua	o to 120 age of a	le for bonus) o minutes) ssessment: English ffered: in the semest	er in which the course is	s offered and in tl	he subsequent semester	
Allocat	ion of _l	olaces				
Additio	onal inf	ormation				
Worklo	ad					
300 h						
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regula	ations for teaching-degree prog	rammes)		
Module	e appea					
		/ • ` • •		`		
Master	-		atics International (2021 atics International (2022			

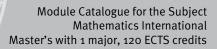
Module title Abbreviation							
Research in Groups - Mathematical Physics 10-M=GMAPin-211-m01							
Module	e coord	inator		Module offered by	<u> </u>		
Dean of Studies Mathematik (Mathematics)			ntics)	Institute of Mathen	natics		
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)			
10							
			Other prerequisites	ther prerequisites			
1 seme	ster	graduate					
Conten	Its						
Recom Depend	mende ding on	ern topics in Mathematic d previous knowledge: the content, basic and a quired. In case of doubt,	dvanced knowledge		of analysis and/or differential		
-		ning outcomes					
The stu	ıdent g				ll Physics. He/She masters ad-		
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Gei	man)			
V (2) + Module	• •	t in: English					
		sessment (type, scope, langua ole for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether		
Langua	age of a	o minutes) ssessment: English ffered: in the semester in	which the course is	offered and in the s	ubsequent semester		
Allocat	ion of _l	places					
Additio	onal inf	ormation					
Workload							
300 h							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	e appea	ars in					
	0	ee (1 major) Mathematics	· · · ·				
Master's degree (1 major) Mathematics International (2022)							
Master	Master's degree (1 major) Mathematics International (2025)						

Module	title		Abbreviation				
Research in Groups - Higher Structures					10-M=GHSTin-222-m01		
Module	coord	inator		Module offered by			
Dean of Studies Mathematik (Mathematics)			atics)	Institute of Mathematics			
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)			
10	nume	rical grade					
Duratio	n	Module level	Other prerequisites				
1 seme	ster	graduate					
Conten	ts						
Recomr Basic k	nende nowlec	s on higher structures an d previous knowledge: lge of the contents of the ommended. Basic knowle	modules "Introduction	on to Differential Ge	etry and topology. ometry" and "Introduction to To-		
Intende	ed leari	ning outcomes					
	The student gets acquainted with current problems in the study of higher structures (e.g. multiple vector bundles and multiple structures, Lie n-algebroids and Lie n-groupoids, graded geometry, representations up to homoto-						
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)			
V (2) + 3							
		t in: English					
		s essment (type, scope, langua; le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether		
Langua	ge of a) minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the su	ıbsequent semester		
Allocation of places							
Additional information							
Workload							
300 h							
Teaching cycle							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module appears in							
Master's degree (1 major) Mathematics International (2022)							
Master's degree (1 major) Mathematics International (2025)							

Module title					Abbreviation
Research in Groups - Functional Analysis					10-M=GFANin-222-m01
Module	coord	inator		Module offered by	
Dean of Studies Mathematik (Mathematics)			atics)	Institute of Mathem	atics
ECTS	Method of grading Only after succ. compl. of module(s)			npl. of module(s)	
10	nume	rical grade			
Duration Module level Other prerequisites					
1 seme	ster	graduate			
Conten	ts				
researc analysi Recom Knowle	h in gro s. nende dge of	oups treats conceptional d previous knowledge:	foundations of fuction	onal analysis as well	tral theory, global analysis. The as relations to other fields of ner knowledge from other areas
		ning outcomes			
		ains insight into contemp this field and can apply t			alysis. He/She masters advanced
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	rman)	
V (2) + 2 Module		t in: English			
		essment (type, scope, langua le for bonus)	ge — if other than German, o	examination offered — if no	t every semester, information on whether
Langua	ge of a	minutes) ssessment: English ffered: In the semester in	which the course is	offered and in the su	ıbsequent semester
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Workload					
300 h					
Teaching cycle					
-					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
Master's degree (1 major) Mathematics International (2022)					
Master's degree (1 major) Mathematics International (2025)					

Module title	Abbreviation					
Research in Groups - Inverse Pro		10-M=GINPin-222-m01				
Module coordinator		Module offered by				
Dean of Studies Mathematik (Ma	thematics)	Institute of Mathematics				
ECTS Method of grading	ECTS Method of grading Only after succ. compl. of modu					
10 numerical grade						
Duration Module level	Other prerequisites	Other prerequisites				
1 semester graduate						
Contents						
Selected modern topics in invers	e problems.					
Recommended previous knowled After consultation with the lectur se Problems 2" is recommended vious semester.	er, prior knowledge from th					
Intended learning outcomes						
The student gains insight into co techniques in this field and can a			ems. He/She masters advanced			
Courses (type, number of weekly contact	hours, language — if other than Ger	rman)				
V (2) + S (2)						
Module taught in: English						
Method of assessment (type, scope module is creditable for bonus)	, language — if other than German,	examination offered — if no	t every semester, information on whether			
talk (60 to 120 minutes)						
Language of assessment: English		- (C				
Assessment offered: In the semester in which the course is offered and in the subsequent semester						
Allocation of places						
Additional information						
Workload						
300 h						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in						
Master's degree (1 major) Mathematics International (2022)						
Master's degree (1 major) Mathematics International (2025)						





Thesis (30 ECTS credits)

Module title					Abbreviation	
Master Thesis Mathematics International 10-M=MAMI-152-mo1					10-M=MAMI-152-m01	
Module coordinator				Module offered by	<u>.</u>	
Dean o	of Studi	es Mathematik (Mathema	atics)	Institute of Mathem	natics	
ECTS				npl. of module(s)		
30	nume	rical grade				
			Other prerequisites	quisites		
1 semester graduate						
Conten	nts					
Indepe	ndently	y researching and writing	on a topic in mathen	natics selected in co	nsultation with the supervisor.	
Intend	ed lear	ning outcomes				
tained	during				pply the skills and methods ob- the result of his/her work in Eng	
Course	S (type, r	number of weekly contact hours,	anguage — if other than Gei	man)		
No cou	irses as	signed to module				
		sessment (type, scope, langua le for bonus)	ge — if other than German,	examination offered — if no	ot every semester, information on whether	
Registr	ration a	is (750 to 900 hours tota nd assignment of topic in ssessment: English		upervisor.		
Allocat	tion of _l	places				
Additio	onal inf	ormation				
Time to	o comp	lete: 6 months				
Worklo	ad					
900 h						
Teachi	ng cycl	e				
Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module	e appea	ars in				
Master	's degr	ee (1 major) Mathematics	s International (2015)			
Master's degree (1 major) Mathematics International (2021)						
	Master's degree (1 major) Mathematics International (2022)					
Master	's degr	ee (1 major) Mathematics	5 International (2025)			