

Module Catalogue

for the Subject

Mathematics

as vertieft studiertes Fach (studied with a focus on the scientific discipline) with the degree "Erste Staatsprüfung für das Lehramt an Gymnasien"

> Examination regulations version: 2009 Responsible: Institute of Mathematics

Contents

The subject is divided into		3
Abbreviations used, Conven	tions, Notes, In accordance with	4
Scientific Discipline		5
Compulsory Courses		6
Propaedeutics of Mathematics		7
Introduction to Geometry		8
Number Theory and Algebra		10
Numerical Mathematics 1		12
Linear Algebra		14
Preparatory Course Mathematic	5	16
Ordinary Differential Equations	and Complex Analysis	17
Analysis for students teaching a	t a German Gymnasium	19
Compulsory Electives		21
Seminar in Analysis		22
Seminar in Linear Algebra		23
Seminar in Algebra		24
Seminar in Geometry		25
Seminar in Number Theory		26
Seminar in Ordinary Differential	Equations	27
Seminar in Complex Analysis		28
Seminar in Numerical Mathema	tics	29
Seminar in Stochastics		30
Introduction to Discrete Mathem		31
Operations Posearch	515	33
Non-Linear Dynamics		35
Computational Mathematics ac	vanced	57 20
Programming course for student	s of Mathematics and other subjects, simple	59 //0
Stochastics 1	s of mathematics and other subjects, simple	40 //1
Numerical Mathematics 2		43
Stochastics 2		45
Programming course for student	s of Mathematics and other subjects	47
Computeroriented Mathematics		49
Advanced Analysis		51
Stochastics for students teachir	ig at a German Gymnasium	53
Reading Course for students tea	ching at a German Gymnasium	55
Teaching		56
Didactics of Mathematics: Algebr	a (German Gymnasium)	57
Didactics of Mathematics: Geome	etry/Calculus (German Gymnasium)	58
Freier Bereich (general as we	ell as subject-specific electives)	60
Mathematics		61
Computers in Mathematical Teaching	ng	62
Didactics of Mathematics: Analytic	Geometry/Stochastics (German Gymnasium)	63
Advanced Didactics of Mathematics	s (German Gymnasium)	64
Hands-on Mathematics		65
E-Learning and Blended Learning in	Mathematics at school	66
Stochastics in Sekundarstufe I (virt	ual course)	68
Basics in Arithmetics (virtual cours	e)	70
Basics in School Geometry (virtual	course)	72
mathematics in Class 10 (virtual co	urse)	74
Inesis		76
Thesis in Mathematics (teaching deg	ree at German Gymnasium)	77
LA Gymnasien Mathematics (2009)	JMU Würzburg ● generated 26-Aug-2024 ● exam. reg. data record Lehramt Gymnasien Mathematik - 2009	page 2 / 77



The subject is divided into

section / sub-section	ECTS credits	starting page
Scientific Discipline	92	5
Compulsory Courses	76	6
Compulsory Electives	16	21
Teaching	10	56
Freier Bereich (general as well as subject-specific electives)		60
Mathematics		61
Thesis	10	76

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 3 / 77
	data record Lehramt Gymnasien Mathematik - 2009	



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:

LASPO2009

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

11-Jul-2012 (2012-79)

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.

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 4 / 77
	data record Lehramt Gymnasien Mathematik - 2009	





Scientific Discipline

(92 ECTS credits)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 5 / 77
	data record Lehramt Gymnasien Mathematik - 2009	i i





Compulsory Courses

(76 ECTS credits)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 6 / 77
	data record Lehramt Gymnasien Mathematik - 2009	1

Module	title				Abbreviation
Propae	deutics	s of Mathematics			10-M-PPM-082-m01
Module coordinator		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)	
2	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 seme:	ster	undergraduate	Admission prerequis specified at the beg	site to assessment: inning of the course)	regular attendance of courses (as).
Conten	ts				
Fundan themat	nental ics, e. g	proof methods and quest g. by reference to its histo	tions in mathematics prical development, a	, insight into examp approach to axiomat	les of abstract concepts of ma- ic and deduction.
Intende	ed lear	ning outcomes			
The stu form ea oral for	dent is Isy mat m.	acquainted with the bas hematical arguments inc	ic proof methods and lependently and pres	d techniques in math ent them adequatel	nematics. He/She is able to per- y and reasonably in written and
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
V + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
Method module is	l of ass creditab	sessment (type, scope, langua le for bonus) ments (type and expendi	ge — if other than German, e	examination offered — if no	et every semester, information on whether
Assess Langua	ment o ge of a	ffered: once a year, winte ssessment: German, Eng	er semester lish if agreed upon w	ith the examiner	
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
[
Teachir	ıg cvcl	e			
	<u> </u>				
Referre	d to in	LPO I (examination regulation:	s for teaching-degree progra	mmes)	
Module	e appea	ars in			
Bachel	or' deg	ree (1 major) Mathematic	s (2008)		
Bachel	Bachelor' degree (1 major) Economathematics (2009)				
Bachel	or deg	ree (1 major) Economathe	ematics (2008)		
Bachel	or deg	ree (1 major) Mathematic	al Physics (2009)	20)	
Bachel	Dachelor's degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major 1 minor) Mathematics (Minor 2008)				
First sta	ate exa	mination for the teaching	g degree Gymnasium	Mathematics (2009))

Module title				Abbreviation	
Introdu	uction t	o Geometry			10-M-GEO-082-m01
Module	e coord	inator		Module offered by	
Dean o	f Studi	es Mathematik (Mathema	atics)	cs) Institute of Mathematics	
ECTS	Meth	od of grading	Only after succ. con	npl. of module(s)	
8	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
1 seme	1 semester undergraduate By way of exception, additional prerequisites are listed in the section o assessments.			isites are listed in the section on	
Conten	its				
Introdu rems, r	iction t elation	o topics in geometry: axio s to linear algebra and al	omatic introduction o lgebra, curves and hy	f projective spaces, persurfaces in Euclie	coordinates, fundamental theo- dean spaces, curvature.
Intende	ed lear	ning outcomes			
The stu	ident is	acquainted with the fun	damental concepts a	nd methods of geom	netry.
Course	S (type, 1	number of weekly contact hours,	language — if other than Ger	rman)	
This mo • 1 • 1	odule ł .o-M-GI .o-M-GI	nas 2 components; inforn E0-1-082: V + Ü (no inforr E0-2-082: V + Ü (no inforr	nation on courses list nation on language a mation on language a	ed separately for ea nd number of weekl nd number of weekl	ch component. y contact hours available) y contact hours available)
Metho module is	d of as s creditat	sessment (type, scope, langua	age — if other than German, o	examination offered — if no	ot every semester, information on whether
This mo	odule ł the two	has the following 2 asses assessment component	sment components. T ts.	o pass the module a	as a whole students must pass

Assessment component to module component 10-M-GEO-1-082: Einführung in die Projektive Geometrie

- 8 ECTS credits, method of grading: numerical grade
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: English, German if agreed upon with the examiner
- Other prerequisites: Admission prerequisite to assessment: successful completion of approx. 50% of exercises. Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment component to module component 10-M-GEO-2-082: Einführung in die Differentialgeometrie

- 8 ECTS credits, method of grading: numerical grade
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: English, German if agreed upon with the examiner
- Other prerequisites: Admission prerequisite to assessment: successful completion of approx. 50% of exercises. Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 8 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Allocation of places

Additional information

--

Workload

--

Teaching cycle

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

§ 73 (1) 4. Mathematik Geometrie

Module appears in

Bachelor' degree (1 major) Mathematics (2008)

Bachelor' degree (1 major) Economathematics (2009)

Bachelor' degree (1 major) Economathematics (2008)

Bachelor' degree (1 major) Mathematical Physics (2009)

Bachelor' degree (1 major) Computational Mathematics (2009)

Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 9 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	e title				Abbreviation
Numbe	r Theo	ry and Algebra			10-M-ZAL-082-m01
Module	e coord	inator		Module offered by	
Dean o	f Studi	es Mathematik (Mathema	atics)	Institute of Mathem	natics
ECTS	ECTS Method of grading Only after succ. cor		npl. of module(s)		
13	nume	rical grade			
Duratio	on	Module level	Other prerequisites		
2 seme	2 semester undergraduate By way of exception, additional prerequisites are listed in the section assessments.		isites are listed in the section on		
Conten	ts				

Introduction to number theory, algebra and their interrelations: basic algebraic structures (groups, rings, fields); discussion of properties of integers and rational numbers (as well as algebraic extensions) with regard to their algebraic structure (residue class rings and finite fields).

Intended learning outcomes

The student is acquainted with the fundamental concepts and methods of number theory and algebra. He/she is able to interrelate these concepts and realises the advantages of thinking across the borders of different branches in mathematics.

Courses (type, number of weekly contact hours, language – if other than German)

This module comprises 3 module components. Information on courses will be listed separately for each module component.

- 10-M-ZAL-1-082: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-ZAL-2-082: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-ZAL-P-082: M (no information on SWS (weekly contact hours) and course language available)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

Assessment in module component 10-M-ZAL-1-082: Introduction to Number Theory Introduction to Number Theory

- 4 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-ZAL-2-082: Introduction to Algebra Introduction to Algebra

- 7 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for

LA Gymnasien Mathematics (2009) JMU Würzburg • generated 26-Aug-2024 • exam. reg.		page 10 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-ZAL-P-082: Examination in Number Theory and Algebra

- 2 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: Successful completion of module component 10-M-ZAL-1 or module component 10-M-ZAL-2 is a prerequisite for participation in module component 10-M-ZAL-P.

Allocation of places

Additional information

UNIVERSITÄT

WÜRZBURG

Workload

Teaching cycle

--

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

§ 73 (1) 2. Mathematik Lineare Algebra, Algebra und Elemente der Zahlentheorie

Module appears in

Bachelor' degree (1 major) Mathematics (2008)

Bachelor' degree (1 major) Economathematics (2009)

Bachelor' degree (1 major) Economathematics (2008)

Bachelor' degree (1 major) Mathematical Physics (2009)

Bachelor' degree (1 major) Computational Mathematics (2009)

Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 11 / 77
	data record Lehramt Gymnasien Mathematik - 2009	



Module title				Abbreviation		
Numerical Mathematics 1				10-M-NM1-082-m01	1	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathe	matics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
1 semester undergraduate		Certain prerequisite sessment. The lectur at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for			
Conten	ts					
Solutio ons, int	n of systerpola	stems of linear equation tion with polynomials,	ons and curve fitting pro splines and trigonome	blems, nonlinear ec tric functions, nume	uations and system	s of equati-
Intende	ed lear	ning outcomes				
The stu to prac	dent is tical pr	acquainted with the f oblems and knows ab	undamental concepts a out their typical fields o	nd methods in nume f application.	erical mathematics, a	applies them
Course	S (type, r	umber of weekly contact hou	rs, language — if other than Gei	rman)		
V + Ü (r	no infor	mation on SWS (week	ly contact hours) and co	ourse language avail	able)	
Methoo module is	d of ass creditab	essment (type, scope, lan le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informat	on on whether
written by an o 2, appr Langua	examin ral exa ox. 30 ge of a	nation (approx. 90 min mination of one candi minutes) ssessment: German, E	utes); if announced by date each (approx. 20 n Inglish if agreed upon w	the lecturer, the writ ninutes) or an oral ex ith the examiner	ten examination car kamination in groups	be replaced (groups of
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir		٥				
	ig cycl	5				
Referre	d to in	IPOI (examination regulat	ions for teaching-degree progra	mmoc)		
§ 73 (1)	5. Mat	hematik Angewandte	Mathematik	inities)		
Module	annea	rs in				
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2009) Bachelor' degree (1 major) Physics (2012)						
			data record Le	ehramt Gymnasien Mathemat	ik - 2009	Page 12 / //

UNIVERSITÄT WÜRZBURG

Bachelor' degree (1 major) Physics (2008) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Technology of Functional Materials (2010) Master's degree (1 major) Technology of Functional Materials (2009) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Functional Materials (2012) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

I A Gymnasien Mathematics (2000)	IMII Würzburg ● generated 26-Aug-2024 ● exam_reg	nage 12 / 77
LA Gymnasien mathematics (2009)	Jino Wulzburg - generated 20 Aug 2024 - exam. reg.	puse 15///
	data record Lehramt Gymnasien Mathematik - 2009	



Module title				Abbreviation	
Linear Algebra				10-M-LNA-082-m01	
Module coordinator				Module offered by	
Dean of Studies Mathematik (Mathematics)		atics)	Institute of Mathematics		
ECTS	ECTS Method of grading Only after succ. o		Only after succ. con	npl. of module(s)	
14	nume	rical grade			
Duration Module level Other prerequisites					
2 semester undergraduate By way of exceptio assessments.		, additional prerequ	isites are listed in the section on		

Contents

Sets, relations and maps; notions of groups, rings and fields (in particular, polynomial rings); vector spaces (subspaces, quotient spaces, linear independency, basis, dimension); linear maps (isomorphism theorem, image, kernel, rank); matrix calculus; systems of linear equations, determinants, eigenvalues, eigenvectors and eigenspaces, diagonalisability (including characteristic polynomial, minimal polynomial), normal forms, bilinear forms; Euclidean and unitary vector spaces (orthonormal bases, isometries, principal axis transformation).

Intended learning outcomes

The student knows and masters the basic notions and essential methods of linear algebra. He/She is able to perform easy mathematical arguments independently, and can present them adequately in written and oral form. He/She is able to apply the central proof methods and concepts of linear algebra and knows about their algebraic and geometric background.

Courses (type, number of weekly contact hours, language - if other than German)

This module comprises 3 module components. Information on courses will be listed separately for each module component.

- 10-M-LNA-1-082: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-LNA-2-082: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-LNA-P-082: M (no information on SWS (weekly contact hours) and course language available)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

Assessment in module component 10-M-LNA-1-082: Linear Algebra 1 Linear Algebra 1

- 7 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-LNA-2-082: Linear Algebra 2 Linear Algebra 2

- 5 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 14 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-LNA-P-082: Examination in Linear Algebra

- 2 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: Successful completion of module component 10-M-LNA-1 or module component 10-M-LNA-2 is a prerequisite for participation in module component 10-M-LNA-P.

Allocation of places

--

Additional information

--

Workload

--

Teaching cycle

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

§ 73 (1) 2. Mathematik Lineare Algebra, Algebra und Elemente der Zahlentheorie

Module appears in

Bachelor' degree (1 major) Computer Science (2010)

Bachelor' degree (1 major) Mathematics (2008)

Bachelor' degree (1 major) Economathematics (2009)

Bachelor' degree (1 major) Economathematics (2008)

Bachelor' degree (1 major) Mathematical Physics (2009)

Bachelor' degree (1 major) Computational Mathematics (2009)

Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.		
	data record Lehramt Gymnasien Mathematik - 2009		

Module title			Abbreviation		
Preparatory Course Mathematics			10-M-VKM-082-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)	
1	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate	Admission prerequis	site to assessment: r inning of the course)	regular attendance of courses (as).
Conten	ts				
Introdu	ction to	o the basic techniques in	mathematics; appro	ach to sets, proposit	tions, propositional logic.
Intende	ed learr	ning outcomes			
The stu the Bac	dent ge helor's	ets acquainted with the b degree study programm	asic working techniq e.	ues which are prered	quisites for the further courses in
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V + Ü (r	no infor	mation on SWS (weekly o	contact hours) and co	ourse language avail	able)
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
project Assessi Langua	assign ment o ge of a	ments (type and expendi ffered: once a year, winte ssessment: German, Eng	ture of time to be spe er semester lish if agreed upon w	ecified by the lecture ith the examiner	er at the beginning of the course)
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
Module appears in					
Bachelor' degree (1 major) Mathematics (2008)					
Bachelo	Bachelor' degree (1 major) Economathematics (2009)				
Bachel	Bachelor' degree (1 major) Economathematics (2008)				
Bachel	Bachelor' degree (1 major) Mathematical Physics (2009)				
Bachel	n uegi nr's dei	ree (1 major) Computation	athematics (Minor 20	997 180	
First sta	ate exa	mination for the teaching	degree Gymnasium	Mathematics (2009)	
			,		

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 16 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module title Abbreviation					
Ordinary Differential Equations and Complex Analysis 10-M-DFT-082-mo1					10-M-DFT-082-m01
Module	f Studio	Inator	atice)	Module offered by	atics
	Metho	ad of grading	Only after succ. com	institute of Mathem	Idlics
12	nume				
Duratio	n	Module level	Other prerequisites		
2 seme	ster	undergraduate	By way of exception assessments.	, additional prerequi	isites are listed in the section on
Conten	ts				
stems c ons, ba function plex an Intende The stu equation	of linea nsic not alysis, ed learn dent is	r diffferential equations, ions in the qualitative the romorphic functions and applications in compute ning outcomes acquainted with the fun- l holomorphic functions.	introduction to the p eory of ordinary differ conformal maps, bas r science, physics, er damental concepts a He/she is able to inte	nd methods of the the	f nonlinear differential equati- asic properties of holomorphic differential equations and com- nd other fields of mathematics.
ges of t		g across the borders of d	ifferent branches in n	nathematics.	
This mo comport 10 10 10	odule c nent. o-M-DF o-M-DF o-M-DF	omprises 3 module comp T-1-082: V + Ü (no inform T-2-082: V + Ü (no inform T-P-082: M (no information	oonents. Information ation on SWS (weekl nation on SWS (weekl on on SWS (weekly co	on courses will be lis y contact hours) and y contact hours) and ontact hours) and co	sted separately for each module course language available) course language available) urse language available)
module is	creditab	le for bonus)	ge — If other than German, e	examination offered — If no	t every semester, information on whether
Assess low. Un vidual a	ment ir Iless st assessi	n this module comprises ated otherwise, successf ments.	the assessments in t ful completion of the	he individual module module will require s	e components as specified be- successful completion of all indi-
 Assessment in module component 10-M-DFT-1-082: Ordinary Differential Equations Ordinary Differential Equations 4 ECTS, Method of grading: (not) successfully completed written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew. Assessment in module component 10-M-DFT-2-082: Introduction to Complex Analysis Introduction to Complex 					

- 7 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 17 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-DFT-P-082: Examination in Ordinary Differential Equations and Complex Analysis

- 2 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: Successful completion of module component 10-M-DFT-1 or module component 10-M-DFT-2 is a prerequisite for participation in module component 10-M-DFT-P.

Allocation of places

Additional information

--

Workload

--

Teaching cycle

--

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

§ 73 (1) 1. Mathematik Analysis

Module appears in

Bachelor' degree (1 major) Mathematics (2008)

Bachelor' degree (1 major) Economathematics (2009)

Bachelor' degree (1 major) Economathematics (2008)

Bachelor' degree (1 major) Mathematical Physics (2009)

Bachelor' degree (1 major) Computational Mathematics (2009)

Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 18 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module title				Abbreviation		
Analys	is for s	tudents teaching at a Ge	rman Gymnasium		10-M-ANL-092-m01	
Module coordinator				Module offered by		
Dean of Studies Mathematik (Mathematics)			atics)	Institute of Mathem	atics	
ECTS	Method of grading Only after succ. con		pl. of module(s)			
17	nume	rical grade				
Duratio	n	Module level	Other prerequisites			
2 semester undergraduate By way of exception assessments.		, additional prerequi	sites are listed in the section on			
Conten	Contents					

Real numbers and completeness, basic topological notions, convergence and divergence of sequences and series, power series, Taylor series, fundamental calculus in one and several variables (including inverse and implicit function theorem); fundamental integral calculus in one variable (Riemann integral and improper integrals).

Intended learning outcomes

The student knows and masters the essential methods and notions of analysis. He/She is able to perform easy mathematical arguments and present them adequately in written and oral form. He/She is acquainted with the central proof methods and concepts in analysis, their analytic background and geometric interpretation. He/She is able to incorporate these concepts in his/her professional teaching.

Courses (type, number of weekly contact hours, language – if other than German)

This module comprises 3 module components. Information on courses will be listed separately for each module component.

- 10-M-ANA-P-082: M (no information on SWS (weekly contact hours) and course language available)
- 10-M-ANL-1-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-ANL-2-092: V + Ü (no information on SWS (weekly contact hours) and course language available)

Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

Assessment in module component 10-M-ANA-P-082: Examination in Analysis

- 2 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: Successful completion of any one of the module components 10-M-ANA-1, 10-M-ANL-1, 10-M-ANA-2, 10-M-ANL-2 is a prerequisite for participation in module component 10-M-ANA-P.

Assessment in module component 10-M-ANL-1-092: Analysis 1 for students teaching at a German Gymnasium Analysis 1 for students teaching at a German Gymnasium

- 6 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 19 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Assessment in module component 10-M-ANL-2-092: Analysis 2 for students teaching at a German Gymnasium Analysis 2 for students teaching at a German Gymnasium

• 9 ECTS, Method of grading: (not) successfully completed

UNIVERSITÄT

WÜRZBURG

- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Allocation of places -Additional information -Workload -Teaching cycle -Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 20 / 7
	data record Lehramt Gymnasien Mathematik - 2009	





Compulsory Electives

(16 ECTS credits)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 21 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	title				Abbreviation
Seminar in Analysis			10-M-BSA-072-m01		
Module coordinator				Module offered by	
Dean o	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	undergraduate			
Conten	ts				
A selec	ted top	ic in analysis.			
Intende	ed leari	ning outcomes			
The stu of a giv ly in a s	dent ga en topi scientif	ains first experience with c using selected literatur ic discussion.	independent scientil e, and prepares a tal	fic work. He/She ma k on the subject. He,	sters elaboration and structuring /She is able to participate active-
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (no ir	format	ion on SWS (weekly cont	act hours) and cours	e language available	.)
Methoo module is	l of ass creditab	eessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
talk (ap Assess Langua	prox. 6 ment o ge of a	50 minutes) ffered: in the semester in ssessment: German, Eng	which the course is lish if agreed upon w	offered ith the examiner	
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 73 (1)	1. Mat	hematik Analysis			
Module	appea	urs in			
Bachel	or' deg	ree (1 major) Mathematic	s (2008)		
Bachel	or' deg	ree (1 major) Mathematic	s (2007)		
Bachel	or' deg	ree (1 major) Economathe	ematics (2009)		
Bachel	or' deg	ree (1 major) Economathe	ematics (2008)		
Bachel	or' deg	ree (1 major) Mathematic	al Physics (2009)	、	
Bachel	or' deg	ree (1 major) Computation	nal Mathematics (200	09)	
Bachel	or's deg	gree (1 major, 1 minor) Ma	atnematics (Minor, 20	DOX) Mathematics (accord	
riist sta	ate exa	mination for the teaching	guegree Gymnasium	mathematics (2009)	

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 22 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	title				Abbreviation
Seminar in Linear Algebra				10-M-BSL-072-m01	
Module coordinator				Module offered by	
Dean of	^F 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	undergraduate			
Content	ts				
A select	ted top	ic in linear algebra.			
Intende	d learr	ning outcomes			
The stu of a give ly in a s	dent ga en topi cientifi	ains first experience with c using selected literatur ic discussion.	independent scientif e, and prepares a tal	fic work. He/She ma k on the subject. He,	sters elaboration and structuring /She is able to participate active-
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available)
Method module is	l of ass creditab	eessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
talk (ap Assessi Langua	prox. 6 ment o ge of a	50 minutes) ffered: in the semester in ssessment: German, Eng	which the course is lish if agreed upon w	offered ith the examiner	
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Workloa	ad				
Teachin	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 73 (1)	2. Mat	hematik Lineare Algebra,	, Algebra und Elemen	te der Zahlentheorie	
Module	appea	ars in			
Bachelo	or' degi	ree (1 major) Mathematic	s (2008)		
Bachelo	or' degi ar' dogi	ree (1 major) Mathematic	S (2007)		
Bachelo	or' degi	ree (1 major) Economathe	ematics (2009)		
Bachelo	Bachelor' degree (1 major) Mathematical Physics (2009)				
Bachelo	Bachelor' degree (1 major) Computational Mathematics (2009)				
Bachelo	ɔr's deរ្	gree (1 major, 1 minor) Ma	athematics (Minor, 20	008)	
First sta	First state examination for the teaching degree Gymnasium Mathematics (2009)				

A Gymnasien Mathematics (2000)	IMII Würzburg ● generated 26-Aug-2024 ● exam_reg	nage 22 / 77
EX Gymnasich Mathematics (2009)	Jino wurzburg - generated zo Aug 2024 - examinerg.	page 25777
	data record Lehramt Gymnasien Mathematik - 2009	

Module	title				Abbreviation
Seminar in Algebra			10-M-BSE-072-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				
A select	ted top	ic in algebra.			
Intende	d learr	ning outcomes			
The stu of a give ly in a s	dent ga en topi cientifi	ains first experience with c using selected literatur ic discussion.	independent scientil e, and prepares a tal	fic work. He/She ma k on the subject. He,	sters elaboration and structuring /She is able to participate active-
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)
Method module is	of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
talk (ap Assessi Langua	prox. 6 ment o ge of a	oo minutes) ffered: in the semester in ssessment: German, Eng	which the course is lish if agreed upon w	offered ith the examiner	
Allocati	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 73 (1)	2. Mat	hematik Lineare Algebra,	, Algebra und Elemen	te der Zahlentheorie	2
Module	appea	ars in			
Bachelo	Bachelor' degree (1 major) Mathematics (2008)				
Bachel	or degi זי' לפסי	ree (1 major) Mathematic ree (1 major) Economathe	5 (2007) matics (2000)		
Bachelo	or' degi	ree (1 major) Economathe	ematics (2009)		
Bachelo	or' degi	ree (1 major) Mathematic	al Physics (2009)		
Bachelo	Bachelor' degree (1 major) Computational Mathematics (2009)				
Bachelo	ɔr's deរ្	gree (1 major, 1 minor) Ma	athematics (Minor, 20	008)	
First sta	First state examination for the teaching degree Gymnasium Mathematics (2009)				

Module t	title				Abbreviation
Seminar	r in Geo	ometry			10-M-BSG-072-m01
Module	coordi	nator		Module offered by	
Dean of S	Studie	s Mathematik (Mathema	itics)	Institute of Mathem	atics
ECTS I	Metho	d of grading	Only after succ. com	pl. of module(s)	
5 r	numeri	cal grade			
Duration	า [Module level	Other prerequisites		
1 semest	ter	undergraduate			
Contents	s				
A selecte	ed topi	c in geometry or differen	tial geometry.		
Intended	d learn	ing outcomes			
The stud of a give ly in a sc	lent ga en topic cientific	ins first experience with using selected literatur discussion.	independent scientil e, and prepares a tal	fic work. He/She ma k on the subject. He,	sters elaboration and structuring /She is able to participate active-
Courses	(type, nu	mber of weekly contact hours, la	anguage — if other than Ger	man)	
S (no inf	formati	on on SWS (weekly cont	act hours) and cours	e language available	2)
Method module is c	of asse	e ssment (type, scope, languag e for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
talk (app Assessm Languag	orox. 60 nent off ge of as	o minutes) fered: in the semester in sessment: German, Eng	which the course is lish if agreed upon w	offered ith the examiner	
Allocatio	on of pl	laces			
Addition	nal info	rmation			
Workloa	d				
Teaching	g cycle				
Referred	l to in L	.POI (examination regulations	for teaching-degree progra	mmes)	
§ 73 (1) 4	4. Math	ematik Geometrie			
Module a	appear	rs in			
Bachelor	r' degre	ee (1 major) Mathematic	s (2008)		
Bachelor	r' degre	ee (1 major) Mathematic	s (2007)		
Bachelor	r' degre	ee (1 major) Economathe	ematics (2009)		
Bachelor	r degre	ee (1 major) Economathe	ematics (2008)		
Bachelor	r' degre	ee (1 major) Mathematics	al Fliysics (2009) nal Mathematics (200	20)	
Bachelor	r's deg	ree (1 major, 1 minor) Ma	athematics (Minor 20	(800 (800	
First stat	te exan	nination for the teaching	degree Gymnasium	Mathematics (2009)	

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 25 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	title				Abbreviation
Seminar in Number Theory			10-M-BSZ-072-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)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
A selec	ted top	ic in number theory.			
Intende	ed leari	ning outcomes			
The stu of a giv ly in a s	dent ga en topi scientif	ains first experience with ic using selected literatur ic discussion.	independent scientil e, and prepares a tal	fic work. He/She ma k on the subject. He,	sters elaboration and structuring /She is able to participate active-
Course	S (type, n	number of weekly contact hours, l	anguage — if other than Ger	man)	
S (no ir	Iformat	ion on SWS (weekly cont	act hours) and cours	e language available	2)
Methoo module is	l of ass creditab	sessment (type, scope, langua ₎ le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
talk (ap Assess Langua	prox. 6 ment o ge of a	50 minutes) ffered: in the semester in ssessment: German, Eng	which the course is lish if agreed upon w	offered ith the examiner	
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	e			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
§ 73 (1)	2. Mat	hematik Lineare Algebra,	, Algebra und Elemen	te der Zahlentheorie	!
Module	e appea	urs in			
Bachel	or' deg	ree (1 major) Mathematic	s (2008)		
Bachel	or' degi	ree (1 major) Mathematic	s (2007)		
Bachel	or deg	ree (1 major) Economathe	ematics (2009)		
Bachel	or' deg	ree (1 major) Economiating	al Physics (2000)		
Bachel	or' deg	ree (1 major) Computation	nal Mathematics (200	9)	
Bachel	or's de	gree (1 major, 1 minor) Ma	athematics (Minor, 20	008)	
First sta	First state examination for the teaching degree Gymnasium Mathematics (2009)				

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 26 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	title				Abbreviation
Semina	r in Or	dinary Differential Equati	ions		10-M-BSW-072-m01
Module	coord	nator		Module offered by	
Dean of Studies Mathematik (Mathematics) Institute of Mathematics			atics		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
5	numer	ical grade			
Duration	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Content	s				
A select	ed top	ic in the theory of ordina	ry differential equation	ons.	
Intende	d learr	ning outcomes			
The stuc of a give ly in a se	dent ga en topi cientifi	ains first experience with c using selected literatur c discussion.	independent scientil e, and prepares a tal	fic work. He/She ma k on the subject. He	sters elaboration and structuring /She is able to participate active-
Courses	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)
Method module is	of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
talk (ap) Assessn Languaន្	prox. 6 nent of ge of a	o minutes) ffered: in the semester in ssessment: German, Eng	which the course is lish if agreed upon w	offered ith the examiner	
Allocati	on of p	laces			
Addition	nal info	ormation			
Workloa	ad				
Teachin	g cycl	9			
Referred	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 73 (1)	1. Mat	nematik Analysis			
Module	appea	rs in			
Bachelo	or' degi	ree (1 major) Mathematic	s (2008)		
Bachelor' degree (1 major) Mathematics (2007)					
Bachelo	or' degi	ee (1 major) Economathe	ematics (2009)		
Bachelo	or' degi	ee (1 major) Economathe	ematics (2008)		
Bachelo	or' degi	ree (1 major) Mathematic	al Physics (2009)		
Bachelo	n degi vr'e deg	ee (1 major) Computation	nai mathematics (200	19) 19)	
First sta	te exa	mination for the teaching	degree Gymnasium	Mathematics (2000)	

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 27 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Seminar in Corplex Analysis and-BSC-072-mo1 Module corplex Mathematik (Mathematics) Institute of Mathematics Dean of Studies Mathematik (Mathematics) Institute of Mathematics ECTS Method is Comparing and its (Mathematics) Institute of Mathematics Some stering and its (Mathematics) Othy after succ. complex final expension (Mathematics) Institute of Mathematics (Mathematics) Some stering and its (Mathematics) Othy after succ. complex final expension (Mathematics) Institute of Mathematics) Some stering outcomes Indergraduate	Module	title				Abbreviation
Module offered by Module offered by Dean J > U = V = V and market (Mathematics) Institute of Mathematics Set g and the market (Mathematics) of module(s) Since I = V = V and market (Mathematics) of module (S) of module (S) Since I = V = V = V and market (Mathematics) of module (S) of module (S) Since I = V = V = V = V = V = V = V = V = V =	Semina	r in Co	mplex Analysis			10-M-BSC-072-m01
Dean of Studies Mathematik (Mathematics) Institute of Mathematics ECTS Method is grading Only after succ. compl. of module(s) S numerial gradie - Duration Module level Other preequisites Internet gradie - Contents Other preequisites - Contents - - Contents Contents The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate actively in a scientific discussion.	Module	coord	inator		Module offered by	
ECTS Meter of grading Only after succ. compl. of module(s) 5 numeer of grading - Duration Module level Other prerequisites 1 semestrie undergraduate - So network - - Contenter - - The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate active-ly in a scientific discussion. Contenter - - - Method of assessment (ope, scope, language – if other than German) S - S (no infermation on SWS (weekly contact hours, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) - Italk (approx. 60 minutes) - - - Allocation - - - Motion - - - - Allocation - - - - Allocation - - - - Yoreditalk (approx. 60 minutes) -	Dean of Studies Mathematik (Mathematics) Institute of Mathematics			atics		
5 numerical grade Duration Module level Other prerequisites 1 semestr undergraduate Contents A selected topic in complex analysis. Intended learning of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate actively in a scientific discussion. Courses (type, number of weeky contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every senseter, information on whether module is creditable for bonus) Italk (approx. 6-o minutes)	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
Duration Module level Other prerequisites 1 semester undergraduate A selected topic in complex analysis. Intende learning outcomes The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate actively in a scientific discussion. Courses (type, number of weekly contact hours, language – if other than German) S S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every senester, information on whether module is creditable for bonus) talk (approx. 6 o minutes) Assessment offered: in the semester in which the course is offered Language of assessment: German, English if agreed upon with the examiner Aldication of places	5	nume	rical grade			
1 semester undergraduate Contents A selected topic in complex analysis. Intende learning outcomes The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate actively in a scientific discussion. Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) The semester in which the course is offered Language of assessment: German, English if agreed upon with the examiner Additional information The semination regulations for teaching-degree programmes) S 73 (1) 1. Mathrematik Analysis Module appears in Bachelor' degree (najor) Mathrematics (2007) Bachelor' degree (najor) Economathematics (2007) Bachelor' degree (najor) Economathematics (2007) Bachelor' degree (najor) Computational Physics (2009) Bachelor' degree (najor) Computational Mathematics (2007) <tr< td=""><td>Duratio</td><td>n</td><td>Module level</td><td>Other prerequisites</td><td></td><td></td></tr<>	Duratio	n	Module level	Other prerequisites		
Contents A selected topic in complex analysis. Intended learning outcomes The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate active, in a scientific discussion. Courses (type, number of weekly contact hours, language — if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language — if other than German) S (no information on SWS (weekly contact hours) is offered Language of assessment: German, English if agreed upon with the examiner Allocation of places Additional information Additional information negulations for teaching-degree programmes) § 73 (1). Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009)	1 seme	ster	undergraduate			
A selected topic in complex analysis. Intended learning outcomes The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate active-ly in a scientific discussion. Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) Italk (approx. 6 on minutes) Assessment offered: in the semester in which the course is offered Language of assessment: German, English if agreed upon with the examiner Allocation of places Morkload Morkload Refered to in LPO1 (examination regulations for teaching-degree programmes) § 73 (1). Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major) Mathematics (2009) Bachelor's degree (1 major) Computational Math	Conten	ts				
Intended learning outcomes The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate actively in a scientific discussion. Courses (type, number of weekly contact hours) and course language available) Courses (type, number of weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: in the semester in which the course is offered Language of assessment: German, English if agreed upon with the examiner Allocation of places Additional information	A selec	ted top	ic in complex analysis.			
The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate active-ly in a scientific discussion. Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: in the semester in which the course is offered Language of assessment: German, English if agreed upon with the examiner Allocation of places Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2009) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Mathematics (2009) Bachelor' degree (1 major) Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major) Mathematics (Minor, 2008	Intende	ed learı	ning outcomes			
Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: in the semester in which the course is offered Language of assessment: German, English if agreed upon with the examiner Allocation of places Additional information Morkload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathema	The stu of a giv ly in a s	dent ga en topi scientif	ains first experience with c using selected literatur ic discussion.	independent scientil e, and prepares a tal	fic work. He/She ma k on the subject. He,	sters elaboration and structuring /She is able to participate active-
S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: in the semester in which the course is offered Language of assessment: German, English if agreed upon with the examiner Allocation of places	Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: in the semester in which the course is offered Language of assessment: German, English if agreed upon with the examiner Allocation of places Additional information Morkload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathe	S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)
talk (approx. 60 minutes) Assessment offered: in the semester in which the course is offered Language of assessment: German, English if agreed upon with the examiner Allocation of places Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2009) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major) Comput	Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
Allocation of places Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major) Computational Mathema	talk (ap Assess Langua	prox. 6 ment o ge of a	50 minutes) ffered: in the semester in ssessment: German, Eng	which the course is lish if agreed upon w	offered ith the examiner	
Additional information Additional information Additional information Additional information Additional information Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gumpacium Mathematics (2000)	Allocat	ion of p	olaces			
Additional information Workload Teaching cycle Referred to in LPO1 (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (2009)						
Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major, 1 minor) Mathematics (2009) Bachelor's degree	Additio	nal inf	ormation			
Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (2009)						
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (2009)	Worklo	ad				
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Ocmputational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gympacium Mathematics (2000)						
Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gympasium Mathematics (2000)	Teachir	ng cycl	e			
Referred to in LPO I (examination regulations for teaching-degree programmes) § 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Sympasium Mathematics (2000)						
§ 73 (1) 1. Mathematik Analysis Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gympasium Mathematics (2000)	Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module appears in Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gympasium Mathematics (2000)	§ 73 (1)	1. Mat	hematik Analysis			
Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Sympasium Mathematics (2000)	Module	appea	nrs in			
Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Sympasium Mathematics (2000)	Bachel	or' deg	ree (1 major) Mathematic	s (2008)		
Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major, 2 minor) Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Sympasium Mathematics (2000)	Bachel	or' deg	ree (1 major) Mathematic	s (2007)		
Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Sympasium Mathematics (2000)	Bachel	or' deg	ree (1 major) Economathe	ematics (2009)		
Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gympasium Mathematics (2000)	Bachel	or' deg	ree (1 major) Economathe	ematics (2008)		
Bachelor's degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2000)	Bachel	or' deg	ree (1 major) Mathematic	al Physics (2009))	
Eacheror's degree (1 major, 1 mmor) mathematics (mmor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2000)	Bachel	or deg	ree (1 major) Computation	nai Mathematics (200	(90 (19)	
	First sta	u s ueg ate exa	gree (1 major, 1 mmor) Ma mination for the teaching	ameniancs (Minor, 20 7 degree Gymnasium	uuoj Mathematics (2000)	

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 28 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	title				Abbreviation
Semina	r in Nu	merical Mathematics			10-M-BSN-072-m01
Module	coord	inator		Module offered by	
Dean o	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	undergraduate			
Conten	ts				
A selec	ted top	ic in numerical mathema	tics.		
Intende	ed learr	ning outcomes			
The stu of a giv ly in a s	dent ga en topi scientif	ains first experience with c using selected literatur ic discussion.	independent scientif e, and prepares a tal	fic work. He/She ma k on the subject. He,	sters elaboration and structuring /She is able to participate active-
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (no ir	format	ion on SWS (weekly cont	act hours) and cours	e language available)
Methoo module is	l of ass creditab	e ssment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
talk (ap Assess Langua	prox. 6 ment o ge of a	oo minutes) ffered: in the semester in ssessment: German, Eng	which the course is lish if agreed upon w	offered ith the examiner	
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachi	ng cycl	9			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
§ 73 (1)	5. Mat	hematik Angewandte Ma	thematik		
Module	e appea	rs in			
Bachel	or' deg	ree (1 major) Mathematic	s (2008)		
Bachel	Bachelor' degree (1 major) Mathematics (2007)				
Bachel	or' degi	ree (1 major) Economathe	ematics (2009)		
Bachel	or degi	ree (1 major) Economathe	ematics (2008)		
Bachel	or degi	ree (1 major) Mathematic	al Physics (2009) nal Mathematics (acc	20)	
Bachel	n uegi nr's der	ree (1 major) Computation	athematics (Minor 20	997 1997	
First sta	ate exa	mination for the teaching	degree Gymnasium	Mathematics (2009)	
		0	- /		

Module	title				Abbreviation
Semina	r in Sto	ochastics			10-M-BSS-072-m01
Module	coord	inator		Module offered by	
Dean of	fStudie	es Mathematik (Mathema	atics)	Institute of Mathematics	
ECTS	Metho	od of grading	Only after succ. com	Only after succ. compl. of module(s)	
5	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
A selec	ted top	ic in stochastics.			
Intende	ed learı	ning outcomes			
The stu of a giv ly in a s	dent ga en topi scientif	ains first experience with c using selected literatur ic discussion.	independent scienti e, and prepares a tal	fic work. He/She ma k on the subject. He,	sters elaboration and structuring /She is able to participate active-
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
S (no in	Iformat	ion on SWS (weekly cont	act hours) and cours	e language available	2)
Methoo module is	of ass	e ssment (type, scope, langua) le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
talk (ap Assessi Langua	prox. 6 ment o ge of a	50 minutes) ffered: in the semester in ssessment: German, Eng	which the course is lish if agreed upon w	offered ith the examiner	
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	9			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
<u>\$ 73 (1)</u>	3. Mat	nematik Stochastik			
Module	appea	irs in	- (0)		
Bachel	or deg or deg	ree (1 major) Mathematic ree (1 major) Mathematic	S (2008) S (2007)		
Bachelo	or' deg	ree (1 major) Economathe	ematics (2009)		
Bachelo	Bachelor' degree (1 major) Economathematics (2008)				
Bachelo	or' deg	ree (1 major) Mathematic	al Physics (2009)		
Bachelo	or' deg	ree (1 major) Computation	nal Mathematics (200	09)	
Bachelo	or's de	gree (1 major, 1 minor) Ma	athematics (Minor, 20	008)	
First sta	ate exa	mination for the teaching	degree Gymnasium	Mathematics (2009)	

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 30 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module title				Abbreviation		
Introdu	ction t	o Discrete Mathematic	5		10-M-EDM-072-mo1	L
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathe	matics)	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 semester undergraduate		Certain prerequisite sessment. The lectur at the beginning of t sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew.			
Conten	ts					
Technic error-cc	ques fro prrectin	om combinatorics, intr g codes.	oduction to graph theor	ry (including applica	tions), cryptographic	: methods,
Intende	ed learr	ning outcomes				
The stu levant p realises	dent is proof te s the so	acquainted with the for echniques, is able to a cope of applications of	undamental concepts a oply methods from num discrete structures.	nd results in discretends in the second s	e mathematics, mas bra to discrete math	ters the re- ematics and
Course	S (type, n	umber of weekly contact hour	s, language — if other than Gei	rman)		
V + Ü (r	no infor	mation on SWS (week	y contact hours) and co	ourse language avail	able)	
Methoo module is	d of ass creditab	e essment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informat	ion on whether
written by an o 2, appr Langua	examir ral exa ox. 30 I ge of a	nation (approx. 90 min mination of one candio minutes) ssessment: German. E	utes); if announced by late each (approx. 20 n nglish if agreed upon w	the lecturer, the writ ninutes) or an oral ex rith the examiner	ten examination car kamination in groups) be replaced 5 (groups of
Allocat	ion of r	olaces	<u></u>			
Additio	nal info	ormation				
Worklo	ad					
Teachir	ng cycl	9				
Referre	Referred to In LPU I (examination regulations for teaching-degree programmes)					
9 73 (1) 2. Mathematik Lineare Algebra, Algebra und Elemente der Zahlentheorie						
Rachole	Module appears in					
Bachelo Bachelo Bachelo Bachelo	or degi or' degi or' degi or' degi	ree (1 major) Computer ree (1 major) Computer ree (1 major) Mathema ree (1 major) Mathema	Science (2007) Science (2010) tics (2008) tics (2007)			
LA Gymnasi	ien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	exam. reg. ik - 2009	page 31 / 77

Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 32 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	e title				Abbreviation	
Introdu	iction t	o Functional Analysis			10-M-FAN-072-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathei	matics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester undergraduate		Certain prerequisite sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se sessment into effect ted to assessment i sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew.			
Conten	ts					
Banach	n space	s and Hilbert spaces, b	ounded operators, prim	nciples of functional	analysis.	
Intende	ed lear	ning outcomes				
The stu methoo broad a	ident k ds, is al applica	nows the fundamental ble to apply methods fi bility of the theory to o	concepts and methods om linear algebra and ther branches of mathe	of functional analys analysis to functiona matics.	is as well as the per al analysis, and reali	tinent proof ses the
Course	S (type, r	number of weekly contact hour	s, language — if other than Gei	rman)		
V + Ü (r	no infoi	rmation on SWS (weekl	y contact hours) and co	ourse language avail	able)	
Methoo module is	d of ass s creditab	Sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	on on whether
written by an o 2, appr Langua	examin oral exa ox. 30 oge of a	nation (approx. 90 min mination of one candic minutes) ssessment: German, E	utes); if announced by late each (approx. 20 n nglish if agreed upon w	the lecturer, the writ ninutes) or an oral ex rith the examiner	ten examination can kamination in groups	be replaced (groups of
Allocat	ion of j	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	ed to in	LPO I (examination regulati	ons for teaching-degree progra	mmes)		
§ 73 (1)	1. Mat	hematik Analysis				
Module appears in						
Bachelo Bachelo Bachelo Bachelo Bachelo	Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Economathematics (2009)					
LA Gymnas	ien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	exam. reg. ik - 2009	page 33 / 77
					-	

Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Master's degree (1 major) Technology of Functional Materials (2010) Master's degree (1 major) Technology of Functional Materials (2009) Master's degree (1 major) Functional Materials (2012) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009) Bachelor' degree (1 major) Technology of Functional Materials (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 34 / 77
	data record Lehramt Gymnasien Mathematik - 2009	



Module title Abb			Abbreviation			
Operat	ions Re	esearch			10-M-ORS-072-m01	
Module	e coord	inator		Module offered by		
Dean of Studies Mathematik (Mathema			matics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester undergraduate		Certain prerequisite sessment. The lectu at the beginning of sidered a declaratio dents have obtained the course of the se sessment into effec ted to assessment i sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew			
Conten	ts					
Linear	prograr	nming, duality theory,	transport problems, int	egral linear program	ming, graph theoreti	ic problems.
Intende	ed lear	ning outcomes				
The stu for solv probler	ident is ving ma ms, bot	acquainted with the f ny practical problems h theoretically and nu	undamental methods ir especially in economic merically.	n operations researcl s. He/She is able to	n, as required as a co apply these methods	entral tool s to practical
Course	S (type, r	number of weekly contact hou	rs, language — if other than Ge	rman)		
V + Ü (r	no infoi	rmation on SWS (week	ly contact hours) and co	ourse language avail	able)	
Metho module is	d of ass creditab	sessment (type, scope, lan le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informati	on on whether
written by an o 2, appr	examin oral exa ox. 30	nation (approx. 90 min mination of one candio minutes) ssessment: German, F	utes); if announced by date each (approx. 20 n	the lecturer, the writ ninutes) or an oral ex vith the examiner	ten examination can kamination in groups	be replaced (groups of
Allocat	ion of r	places				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
	-5 cycl					
Referre	d to in	IPOI (examination regulat	ions for teaching-degree progra	ummec)		
δ 72 (1)	5 Mat	hematik Angewandte	Mathematik	(inities)		
Module	annea	ars in	Mathematik			
Bachel Bachel Bachel Bachel Bachel	Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009)					
LA Gymnas	ien Mathe	matics (2009)	JMU Würzburg data record Lo	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	exam. reg. ik - 2009	page 35 / 77

Julius-Maximilians-UNIVERSITÄT WÜRZBURG



Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009) JMU Würzburg • generated 26-Aug-2024 • exam. reg. page 36 / 77 data record Lehramt Gymnasien Mathematik - 2009


Module title				Abbreviation		
Non-Liı	near Dy	namics			10-M-NLD-072-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathe	matics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester undergraduate		Certain prerequisite sessment. The lectur at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew			
Conten	ts		r			
Basic n dixson,	otions , chaoti	in stability theory, Lya c dynamics; applicatio	punov theory; stable mons in physics and biolo	anifolds, periodic so ogy (e. g. Hamiltonia	lutions including Po n systems, Volterra-I	incare-Ben- ₋otka).
Intende	ed lear	ning outcomes				
The stu thods.	ident is He/She	acquainted with the file is able to apply these	undamental concepts a methods to simple situ	nd results in non-lin Jations, e.g. in physi	ear dynamics and th cs or biology.	eir proof me-
Course	S (type, r	umber of weekly contact hou	rs, language — if other than Gei	rman)		
v + Ü (r	no infoi	mation on SWS (week	ly contact hours) and co	ourse language avail	able)	
Metho module is	d of ass creditab	essment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informat	on on whether
written by an o 2, appr Langua	examin oral exa ox. 30 oge of a	nation (approx. 90 min mination of one candio minutes) ssessment: German. E	utes); if announced by date each (approx. 20 n nglish if agreed upon w	the lecturer, the writ ninutes) or an oral ex rith the examiner	ten examination car camination in groups	be replaced (groups of
Allocat	ion of p	olaces	<u> </u>			
Additio	nal inf	ormation				
 Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulat	ions for teaching-degree progra	mmes)		
§ 73 (1) 1. Mathematik Analysis						
Module	e appea	irs in				
Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009)						
LA Gymnas	ien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	exam. reg. ik - 2009	page 37 / 77



Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 38 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	e title			,	Abbreviation	
Computational Mathematics, advanced 10-M-COMg-082-m01					01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathen	natics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
4	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	Admission prerequi (attendance monito sence).	site to assessment: ı red, a maximum of o	regular attendance o ne incident of unexo	of exercises cused ab-
Conten	ts					
Introdu merical 10-M-A lar diffe	ction to comp NL and erential	o modern mathematica utation (e.g. Matlab) to 10-M-LNA). Computer-h and integral calculus;	l software for symbolic supplement the basic based solution of prob visualisation of functic	computation (e.g. M modules in analysis lems in linear algebr ons.	Mathematica or Map and linear algebra (a, geometry, analysi	le) and nu- (10-M-ANA, s, in particu-
Intende	ed lear	ning outcomes				
The stu fields o	dent le f appli	earns the use of advanc cation to solve mathem	ed modern mathemati atical problems.	cal software package	es, and is able to ass	sess their
Course	S (type, r	number of weekly contact hours	s, language — if other than Ge	rman)		
Ü + V (r	no infor	mation on SWS (weekly	y contact hours) and co	ourse language avail	able)	
Methoo module is	d of ass creditab	eessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
project beginni Assess Langua	in the ing of t ment o ge of a	form of programming ex he course) ffered: once a year, sun ssessment: German, Er	kercises (type and exp nmer semester nglish if agreed upon w	enditure of time to be vith the examiner	e specified by the le	cturer at the
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	immes)		
§ 73 (1)	5. Mat	hematik Angewandte N	 Nathematik	-		
Module	appea	ars in				
Bachel	or' deg	ree (1 major) Mathemat	ics (2008)			
Bachelor' degree (1 major) Nanostructure Technology (2010)						
Bachelor' degree (1 major) Economathematics (2009)						
Bachel	or' deg	ree (1 major) Economat	hematics (2008)			
Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2000)						
Master	Master's degree (1 major) Technology of Functional Materials (2009)					
Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)						
First sta	ate exa	mination for the teaching	ng degree Gymnasium	Mathematics (2009)		
LA Gymnas	ien Mathe	matics (2009)	JMU Würzburg data record L	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	exam. reg. ik - 2009	page 39 / 77

Module title				Abbreviation	
Progra	mming	course for students of M	10-M-PRGk-082-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)	
2	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate	Admission prerequis monitored, a maxim	site to assessment: r um of one incident c	regular attendance (attendance of unexcused absence).
Conten	ts				
Basics matics.	of a mo	odern programming langu	uage (e. g. C or Fortrai	n) taking into accour	nt the particular needs in mathe-
Intende	ed leari	ning outcomes			
The stu in math	dent is iematio	able to work independents.	ntly on small program	nming exercises and	standard programming problems
Course	S (type, r	umber of weekly contact hours, l	anguage — if other than Ger	man)	
P (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)
Methoo module is	d of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
project beginni Langua	in the ing of t ge of a	form of programming exe he course) ssessment: German, Eng	rcises (type and expe	enditure of time to be ith the examiner	e specified by the lecturer at the
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachi	ıg cycl	e			
	<u> </u>				
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 73 (1)	5. Mat	hematik Angewandte Ma	thematik		
Module	e appea	ars in			
Bachel	or' deg	ree (1 major) Mathematic	s (2008)		
Bachel	or' deg	ree (1 major) Nanostructu	re Technology (2010)		
Bachel	Bachelor' degree (1 major) Economathematics (2009)				
Bachel	or' deg	ree (1 major) Economathe	ematics (2008)		
Bachel	or' deg	ree (1 major) Mathematic	al Physics (2009)	、 、	
Bachel	or' deg	ree (1 major) Computatio	nal Mathematics (200	09)	
Bachel	or's de	gree (1 major, 1 minor) Ma	atnematics (Minor, 20	008) Mathamatics (c.c.)	
FIRST Sta	First state examination for the teaching degree Gymnasium Mathematics (2009)				



Module	title				Abbreviation	
Stochas	Stochastics 1				10-M-ST1-082-m01	
Module	coord	inator		Module offered by		
Dean of	fStudie	es Mathematik (Mathe	matics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
8	nume	rical grade				
Duratio	n	Module level	Other prerequisites	i		
1 semester undergraduate		Certain prerequisite sessment. The lectur at the beginning of the sidered a declaration dents have obtained the course of the se sessment into effect ted to assessment i sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew.			
Conten	ts					
Combin continu chastic varianc	natorics Ious dis Indepe e, limit	s, Laplace models, sele stributions: normal dis endence, elementary c theorems: law of large	ected discrete distributi tribution, random varia onditional probability, e numbers, central limit	ons, elementary mea ble, distribution fun characteristics of dis theorem.	asure and integration ction, product meas tributions: expected	n theory, ures and sto- I value and
Intende	ed learr	ning outcomes				
The stu practica	dent is al prob	acquainted with fund lems and knows about	amental concepts and r the typical fields of ap	nethods in stochasti plication.	cs, applies these m	ethods to
Courses	S (type, n	umber of weekly contact hour	s, language — if other than Gei	rman)		
V + Ü (n	no infor	mation on SWS (week	y contact hours) and co	ourse language avail	able)	
Method module is	l of ass creditab	e essment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informati	on on whether
written by an o 2, appro Langua	examir ral exa ox. 30 I ge of a	nation (approx. 90 min mination of one candio minutes) ssessment: German, E	utes); if announced by date each (approx. 20 n nglish if agreed upon w	the lecturer, the writ ninutes) or an oral ex rith the examiner	ten examination can camination in groups	be replaced (groups of
Allocati	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
§ 73 (1) 3. Mathematik Stochastik						
Module appears in						
Bachelo Bachelo Bachelo	Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Economathematics (2009)					
LA Gymnasi	ien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	xam. reg. ik - 2009	page 41 / 77



Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 42 / 77
	data record Lehramt Gymnasien Mathematik - 2009	



Module	title				Abbreviation	
Numerical Mathematics 2					10-M-NM2-082-mo	1
Module	e coord	inator		Module offered by		
Dean o	f Studie	es Mathematik (Mathe	matics)	Institute of Mathem	natics	
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester undergraduate		Certain prerequisite sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se sessment into effect ted to assessment in sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anow.			
Conten	ts					
Solutio narv dif	n meth fferenti	ods and applications al equations, boundar	for eigenvalue problems v value problems.	s, linear programmin	ıg, initial value probl	ems for ordi-
Intende	ed lear	ning outcomes	<u>, , , , , , , , , , , , , , , , , , , </u>			
The student is able to draw a distinction between the different concepts of numerical mathematics and knows about their advantages and limitations concerning the possibilities of application in different fields of natural and engineering sciences and economics.						
V + Ü (r	o infor	mation on SWS (week	ly contact hours) and co	urse language avail	able)	
Methoo module is	d of ass	essment (type, scope, lan le for bonus)	guage — if other than German, e	examination offered — if no	ot every semester, informati	ion on whether
written by an o 2, appr Langua	examin ral exa ox. 30 ge of a	nation (approx. 90 mir mination of one candi minutes) ssessment: German, E	nutes); if announced by date each (approx. 20 n Inglish if agreed upon w	the lecturer, the writ ninutes) or an oral ex ith the examiner	ten examination car xamination in groups	be replaced (groups of
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachir	ng cycl	e				
Referre	d to in	LPO I (examination regulat	ions for teaching-degree progra	mmes)		
§ 73 (1)	5. Mat	hematik Angewandte	Mathematik			
Module	e appea	irs in				
Bachelo Bachelo Bachelo Bachelo	or' deg or' deg or' deg or' deg	ree (1 major) Mathema ree (1 major) Physics (; ree (1 major) Physics (; ree (1 major) Physics (;	itics (2008) 2010) 2009) 2012)			
LA Gymnasi	ien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	exam. reg. tik - 2009	page 43 / 77
						λ

UNIVERSITÄT WÜRZBURG

Bachelor' degree (1 major) Physics (2008) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Technology of Functional Materials (2010) Master's degree (1 major) Technology of Functional Materials (2009) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Master's degree (1 major) Functional Materials (2012) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	IMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 44 / 77
	data record Lehramt Gymnasien Mathematik - 2009	



Module title Abbreviation				Abbreviation		
Stocha	stics 2				10-M-ST2-082-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathe	matics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
5	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester undergraduate		Certain prerequisite sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se sessment into effect ted to assessment in sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew.			
Conten	ts					
Elemen	its of d	ata analysis, statistics	of data in normal and c	other distributions, e	lements of multivari	ate statistics.
Intende	ed lear	ning outcomes				
The stu tical pr	dent is oblems	acquainted with fundations and knows about the	amental concepts and r typical fields of applica	nethods in statistics ition.	, applies these meth	ods to prac-
Course	S (type, r	number of weekly contact hour	s, language — if other than Ger	rman)		
V + Ü (r	no infoi	mation on SWS (week	y contact hours) and co	ourse language avail	able)	
Methoo module is	d of ass s creditab	Sessment (type, scope, lang le for bonus)	guage — if other than German, o	examination offered — if no	t every semester, informati	on on whether
written by an o 2, appr Langua	examii oral exa ox. 30 ige of a	nation (approx. 90 min mination of one candio minutes) ssessment: German, E	utes); if announced by late each (approx. 20 n nglish if agreed upon w	the lecturer, the writ ninutes) or an oral ex rith the examiner	ten examination can amination in groups	be replaced (groups of
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulati	ons for teaching-degree progra	immes)		
§ 73 (1) 3. Mathematik Stochastik						
Module	Module appears in					
Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)						
LA Gymnas	ien Mathe	matics (2009)	data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	ik - 2009	page 45 / 77



First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 46 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module title			Abbreviation			
Progra	Programming course for students of Mathematics and other subjects 10-M-PRG-082-mo1					
Modul	e coord	inator		Module offered by	_	
Dean o	f Studi	es Mathematik (Mathem	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
3	(not)	successfully completed		· · · · · ·		
Duratio	on <u>n</u>	Module level	Other prerequisites			
1 seme	ster	undergraduate	Admission prerequi	site to assessment: I	regular attendance (a	attendance
Conter	ite					
Basics matics	of a mo	odern programming lang	uage (e. g. C or Fortra	n) taking into accour	nt the particular need	ls in mathe-
Intend	ed lear	ning outcomes				
The stu in matl	udent is nematio	able to work independe	ently on small program	nming exercises and	standard programm	ing problems
Course	S (type, r	number of weekly contact hours,	language — if other than Ger	man)		
P (no ii	nformat	tion on SWS (weekly cor	tact hours) and cours	e language available	e)	
Metho module i	d of ass s creditab	sessment (type, scope, langu le for bonus)	age — if other than German, o	examination offered — if no	t every semester, informati	on on whether
project Langua	in the age of a	form of programming ex ssessment: German, En	ercises (as specified a glish if agreed upon w	at the beginning of th rith the examiner	ne course)	
Allocat	ion of p	olaces				
	-		,			
Additio	onal inf	ormation	_			
			_			
Worklo	ad		,			
Teachi	ng cycl	e				
Poforra	d to in		-	mmoc)		
8 72 (1)		homatik Angowandto M	athomatik	inines)		
8/3(1) Moduli						
Rachol	e appea	roo (1 maior) Mathamati	cc (2008)			
Bachel	or' deg	ree (1 major) Mathemati	un)			
Bachel	or' deg	ree (1 major) Physics (20	009)			
Bachel	or' deg	ree (1 major) Physics (20	012)			
Bachel	or' deg	ree (1 major) Physics (20	008)			
Bachel	or' deg	ree (1 major) Technology	of Functional Materia	als (2009)		
Bachelor' degree (1 major) Technology of Functional Materials (2010)						
Bachel	Bachelor' degree (1 major) Nanostructure Technology (2010)					
Bachel	Bachelor' degree (1 major) Economathematics (2009)					
Bachel	or' deg	ree (1 major) Economath	ematics (2008)			
Bachel	or' deg	ree (1 major) Mathemati	cal Physics (2009)	,		
Bachel	or' deg	ree (1 major) Computatio	onal Mathematics (20	09)		
Master	's degr	ee (1 major) Physics (20	10) of Functional Material			
master	s degr	ee (1 major) rechnology	or runctional Material	5 (2010)		
LA Gymnas	sien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	exam. reg. ik - 2009	page 47 / 77



Master's degree (1 major) Technology of Functional Materials (2009) Master's degree (1 major) Functional Materials (2012) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 48 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	e title				Abbreviation	
Compu	terorie	nted Mathematics			10-M-COM-082-mo	1
Module	e coord	inator		Module offered by	ļ	
Dean o	f Studi	es Mathematik (Mathem	atics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
2	(not)	successfully completed				
Duratic	n (1101) -		Other prerequisites			
Duratic	stor	undergraduate	Admission proroqui	cita ta accoccment.	rogular attendance o	fovorcicoc
1 senie	Ster	undergraduate	(attendance monito sence).	red, a maximum of o	ne incident of unexc	used ab-
Conten	ts		_			
Introdu merica 10-M-A lar diffe	iction to l compi NL) and erential	o modern mathematical utation (e. g. Matlab) to d 10-M-LNA). Computer-b l and integral calculus; v	software for symbolic supplement the basic based solution of prob isualisation of functic	computation (e.g. <i>N</i> modules in analysis plems in linear algeb pns.	Mathematica or Map and linear algebra (ra, geometry, analys	le) and nu- ((10-M-ANA or is, in particu-
Intende	ed lear	ning outcomes				
The stu fields c	ident le of appli	earns the use of advance cation to solve mathema	ed modern mathemati atical problems.	cal software package	es, and is able to ass	sess their
Course	S (type, r	number of weekly contact hours,	language — if other than Ge	rman)		
V + Ü (r	no infoi	rmation on SWS (weekly	contact hours) and co	ourse language avail	able)	
Metho module is	d of ass s creditab	Sessment (type, scope, langu le for bonus)	age — if other than German,	examination offered — if no	t every semester, informati	on on whether
project	in the	form of programming ex	ercises (as specified a	at the beginning of th	ne course)	
Assess	ment o	ffered: once a year, sum	mer semester			
Langua	ige of a	ssessment: German, En	glish if agreed upon w	lith the examiner		
Allocat	ion of p	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teachi	ng cycl	е				
Referre	ed to in	LPO I (examination regulation	ns for teaching-degree progra	ammes)		
§ 73 (1)	5. Mat	hematik Angewandte M	athematik			
Module	e appea	ars in				
Bachel	or' deg	ree (1 major) Computer S	Science (2010)			
Bachel	or' deg	ree (1 major) Mathemati	cs (2008)			
Bachel	Bachelor' degree (1 major) Physics (2010)					
Bachel	Bachelor' degree (1 major) Physics (2009)					
Bachel	or' deg	ree (1 major) Physics (20	012)			
Bachel	Bachelor' degree (1 major) Physics (2008)					
Bachel	or deg	ree (1 major) Technology	or Functional Materia	ais (2009) als (2010)		
Bachol	or' deg	ree (1 major) Technology	ure Technology (2010	ais (2010))		
Bachel	or' deg	ree (1 major) Fronomath	iematics (2000))		
LA Gymnas	ien Mathe	matics (2009)	JMU Würzburg	• generated 26-Aug-2024 • e	exam. reg.	page 49 / 77



Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Master's degree (1 major) Physics (2010) Master's degree (1 major) Technology of Functional Materials (2010) Master's degree (1 major) Technology of Functional Materials (2009) Master's degree (1 major) Functional Materials (2012) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 50 / 77
	data record Lehramt Gymnasien Mathematik - 2009	



Module	e title				Abbreviation	
Advanced Analysis					10-M-VAN-082-m01	
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mathe	matics)	Institute of Mathem	atics	
ECTS	Metho	od of grading	Only after succ. con	npl. of module(s)		
8	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester undergraduate		Certain prerequisite sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se sessment into effect ted to assessment i sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for			
Conten	ts					
Lebesg and ele	ue inte ementa	gral in several variable ry Fourier theory in L^2	es, including theorems of , Gauss's theorem.	on convergence and	Fubini's theorem, L^	p-spaces
Intende	ed lear	ning outcomes				
The stu she is a	dent is able to	acquainted with adva understand the constr	nced topics in analysis uction of a complex ma	. Taking the example thematical concept.	of the Lesbegue int	egral, he or
Course	Courses (type, number of weekly contact hours, language — if other than German)					
Ü + V (1	no infoi	mation on SWS (week	ly contact hours) and co	ourse language avail	able)	
Metho module is	d of ass creditab	essment (type, scope, lang le for bonus)	guage — if other than German,	examination offered — if no	t every semester, informati	on on whether
written by an o 2, appr Langua	examin oral exa ox. 30 oge of a	nation (approx. 90 min mination of one candio minutes) ssessment: German, E	utes); if announced by date each (approx. 20 n nglish if agreed upon w	the lecturer, the writ ninutes) or an oral ex rith the examiner	ten examination can camination in groups	be replaced (groups of
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulation	ions for teaching-degree progra	immes)		
§ 73 (1)	1. Mat	hematik Analysis				
Module	e appea	irs in				
Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Economathematics (2009) Bachelor' degree (1 major) Economathematics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009)						
LA Gymnas	ien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	ik - 2009	page 51 / 77



Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 52 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module title				Abbreviation		
Stocha	Stochastics for students teaching at a German Gymnasium				10-M-STL-092-m01	
Module coordinator				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)		
9	nume	rical grade				
Duratio	on	Module level	Other prerequisites			
1 semester undergraduate		Certain prerequisite sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se sessment into effect ted to assessment i sessment at a later admission to assess	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment and the subsequent semester.		D as- ctive details ill be con- nt. If stu- ssment over ation for as- ill be admit- ster. For as- alification for	
Conten	ts					
Discret assum discret conditi ce and and sta	Discrete statistics, in particular stochastic modelling, motivation of conceptualisation and discussion of basic assumptions: basic notions of descriptive statistics, discrete probability spaces, random variables, important discrete distributions, elements of combinatorics, principle of inclusion and exclusion, multistage experiments, conditional probability, stochastic independence, common distributions, expected value and variance, covariance and correlation, waiting time problems, law of the large numbers, central limit theorem, confidence intervals and statistical tests in binomial models, stochastic paradoxes.				on of basic important xperiments, nce, covarian- ce intervals	
Intende	ed lear	ning outcomes				
The stu Germai stical s	ident is n Gymn ignifica	acquainted with funda asium. He/She is able ance.	mental concepts and r to assess stochastic p	nethods of stochast henomena correctly	ics, as required for to and handle the conc	eaching at ept of stati-
Course	S (type, r	number of weekly contact hours	s, language — if other than Gei	rman)		
V + Ü (r	no info	mation on SWS (weekly	y contact hours) and co	ourse language avail	able)	
Metho module is	d of ass creditab	sessment (type, scope, lang le for bonus)	uage — if other than German,	examination offered — if no	t every semester, informati	ion on whether
written by an o 2, appr Langua	examin oral exa rox. 30 nge of a	nation (approx. 90 minu mination of one candid minutes) ssessment: German, Er	utes); if announced by ate each (approx. 20 n nglish if agreed upon w	the lecturer, the writ ninutes) or an oral ex rith the examiner	ten examination can kamination in groups	be replaced s (groups of
Allocat	ion of _l	olaces				
Additio	nal inf	ormation				
	-					
Worklo	ad					
Teachi	ng cycl	e				
Referre	d to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)		
§ 73 (1)	3. Mat	hematik Stochastik				
Module	e appea	nrs in				
LA Gymnas	ien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	exam. reg. :ik - 2009	page 53 / 77

First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 54 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module	title				Abbreviation
Reading Course for students teaching at a German Gymna:			at a German Gymnas	ium	10-M-RCL-092-m01
Module	coord	inator		Module offered by	
Dean of	f Studie	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)	
2	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Indepei ge in th	ndent s e class	study of a defined topic in room, e. g. in a school pi	n mathematics with tl roject.	he goal of being able	e to apply the acquired knowled-
Intende	ed learr	ning outcomes			
The stu text and	dent is d can u	able to work independer se standard literature.	ntly on a given scient	ific topic. He or she o	can tackle a simple mathematical
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
A (no in	ıformat	ion on SWS (weekly cont	act hours) and cours	e language available	2)
Methoo module is	l of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
talk (ap Langua	prox. 3 ge of a	o minutes) or written ela ssessment: German, Eng	boration (approx. 5 to lish if agreed upon w	o 10 pages) ith the examiner	
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachir	ng cyclo	e			
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	in			
First sta	ate exa	mination for the teaching	g degree Gymnasium	Mathematics (2009)	





Teaching (10 ECTS credits)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 56 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module title			Abbreviation		
Didactics of Mathematics: Algebra (German Gymnasium)			rman Gymnasium)		10-M-D1GY-092-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)	
3	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Conten	ts				
Discuss fe l) as v gies.	sion of well as	basic topics in mathema discussion of possibiliti	tics didactics for Gym es of implementation	nasium using the ex i in the classroom, al	ample of algebra (Sekundarstu- lso including modern technolo-
Intende	ed learn	ning outcomes			
The stur field of pics, He strategi	dent is algebr e/She l es for t	acquainted with basic m a in Sekundarstufe I) and knows important aspects teaching and learning un	athematical ways of is able to take into a of planning and ana d can assess them.	thinking and working account the students lysing teaching of ma	g techniques (in particular in the 'perception of mathematical to- athematics, masters different
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (no in	Iformat	ion on SWS (weekly cont	act hours) and cours	e language available)
Method	l of ass	e essment (type, scope, langua;	ge — if other than German, e	examination offered — if no	t every semester, information on whether
a) writte or c) ora ges) or	en exar al exan e) proj	nination (approx. 60 min nination in groups (group ect (as specified at the be	utes) or b) oral exam s of 3, approx. 30 mi eginning of the cours	ination of one candio nutes) or d) written e e)	date each (approx. 15 minutes) laboration (approx. 5 to 10 pa-
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teaching cycle					
Referre	d to in	LPO I (examination regulations	s for teaching-degree progra	mmes)	
§ 73 (1)	6. Mat	hematik Didaktik			
Module	appea	irs in			
First sta	ate exa	mination for the teaching	degree Gymnasium	Mathematics (2009)	

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 57 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module title			Abbreviation	
Didactics of	Mathematics: Geometry/	Calculus (German Gyı	mnasium)	10-M-D2GY-092-m01
Module coo	rdinator		Module offered by	
Dean of Stu	Dean of Studies Mathematik (Mathematics)		Institute of Mathem	natics
ECTS Met	hod of grading	Only after succ. con	npl. of module(s)	
7 num	nerical grade			
Duration	Module level	Other prerequisites	i	
2 semester	undergraduate			
Contents				
Discussion darstufe I) a also includi	of advanced topics in matl nalysis (Sekundarstufe II) ng modern technologies.	nematics didactics for as well as discussion	r Gymnasium using t of possibilities of in	he examples of geometry (Sekun- nplementation in the classroom,
Intended lea	arning outcomes			
of geometry s'perceptior thematics, r	in Sekundarstufe I and an of mathematical topics, I nasters different strategies	alysis in sekundarstu le/She knows different for teaching and lea	ing and working tech ife II) and is able to t nt aspects of plannir rning und can asses	ake into account the student- ng and analysing teaching of ma- s them.
Courses (type	e, number of weekly contact hours,	language — if other than Ger	rman)	
• 10-M- • 10-M- • 10-M- • 10-M- Method of a module is credit	D2GY-P-092: M (no inform D2GY-2-092: V + Ü (no info D2GY-1-092: V + Ü (no info ssessment (type, scope, langu able for bonus)	ation on SWS (weekly ormation on SWS (wee rmation on SWS (wee age — if other than German,	contact hours) and ekly contact hours) a ekly contact hours) a examination offered — if no	course language available) nd course language available) nd course language available) ot every semester, information on whether
Assessment low. Unless vidual asses	in this module comprises stated otherwise, success sments.	the assessments in t ful completion of the	he individual modul module will require	e components as specified be- successful completion of all indi-
Assessment man Gymna • 1 ECTS • writte replac group	i n module component 10 sium) 5, Method of grading: num n examination (approx. 90 ed by an oral examination s (groups of 2, approx. 40	• M-D2GY-P-092: Dida erical grade minutes); if announc o of one candidate ea minutes)	ctics of Mathematics ced by the lecturer, t ich (approx. 20 minu	5: Exam Geometry/Calculus (Ger- he written examination can be ites) or an oral examination in
 Only after successful completion of module components: Successful completion of the module components 10-M-D2GY-1 and 10-M-D2GY-2 is a prerequisite for participation in module component 10-M-D2GY-P. Assessment in module component 10-M-D2GY-2-092: Didactics of Mathematics: Calculus (German Gymnasium) Didactics of Mathematics: Calculus (German Gymnasium) 2 ECTS, Method of grading: (not) successfully completed exercises: At the beginning of the course, the lecturer will specify the type and scope of exercises to 				
be succe succe Assessment Didactics of	ccessfully completed over ssfully completed. in module component 10 Mathematics: Geometry (5, Method of grading: (not)	the course of the sem - M-D2GY-1-092: Dida German Gymnasium)) successfully comple	nester for the module ctics of Mathematics ted	e component to be considered :: Geometry (German Gymnasium)

Allocation of places

Additional information

--

Workload

Teaching cycle

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

§ 73 (1) 6. Mathematik Didaktik

Module appears in

First state examination for the teaching degree Gymnasium Mathematics (2009)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 59 / 7
	data record Lehramt Gymnasien Mathematik - 2009	



Freier Bereich (general as well as subject-specific electives)

(ECTS credits)

Teaching degree students must take modules worth a total of 15 ECTS credits in the area Freier Bereich (general as well as subject-specific electives) (Section 9 LASPO (general academic and examination regulations for teaching-degree programmes)). To achieve the required number of ECTS credits, students may take any modules from the areas below.

Freier Bereich -- interdisciplinary: The interdisciplinary additional offer for a teaching degree can be found in the respective Annex "Ergänzende Bestimmungen für den "Freien Bereich" im Rahmen des Studiums für ein Lehramt".

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 60 / 77
	data record Lehramt Gymnasien Mathematik - 2009	





Mathematics (ECTS credits)

(Freier Bereich (general as well as subject-specific electives) -- subject specific)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 61 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module title			Abbreviation		
Computers in Mathematical Teaching				10-M-DCMU-092-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)	
3	(not) s	successfully completed			
Duratio	n	Module level	Other prerequisites		
1 semes	ster	undergraduate			
Conten	ts				
Discuss puter to	ion of ools.	possible ways to use con	nputers in teaching m	athematics as well a	as discussion of common com-
Intende	ed leari	ning outcomes			
The stu tics, as	dent is well as	acquainted with basic p with the potential and li	ossibilities for the em mitations of compute	ployment of computer tools.	ters in the teaching of mathema-
Courses	5 (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
V (no in	Iformat	ion on SWS (weekly cont	act hours) and course	e language available)
Method module is	l of ass creditab	e essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
project Assessi	(type a ment o	nd expenditure of time to ffered: every two years, s	b be specified by the ummer semester	lecturer at the begin	ning of the course)
Allocati	ion of p	olaces			
Additio	nal inf	ormation			
Worklo	ad				
Teachir	ng cycl	9			
Referre	d to in	LPOI (examination regulations	s for teaching-degree progra	mmes)	
Module	appea	irs in			
First sta	ate exa	mination for the teaching	degree Hauptschule	Mathematics (2009)
First sta	ite exa	mination for the teaching	degree Hauptschule	Didactics in Mathem	natics (Secondary School) (2009)
First sta	ate exa	mination for the teaching	degree Realschule N	Nathematics (2009)	
FIRST Sta	ite exa	mination for the teaching	, degree Gymnasium i degree Gymnasium i	Mathematics (2012) Mathematics (2000)	
First sta	ite exa	mination for the teaching	degree Sonderpädas	gogik Didactics in Ma	athematics (Secondary School)
(2009)				<u>.</u>	
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2013)					
First sta First sta	ate exa ate exa	mination for the teaching mination for the teaching	degree Mittelschule degree Mittelschule	Mathematics (2013) Didactics in Mathem	natics (Middle School) (2013)

Module title			Abbreviation		
Didactics of Mathematics: Analytic Geometry/Stochastics (German Gymum)			German Gymnasi-	10-M-D3GY-092-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. com	pl. of module(s)	
3	(not) s	successfully completed			
Duratio	on	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	Its				
Discus stocha cluding	sion of stics (S g mode	basic topics in mathema ekundarstufe I) as well a rn technologies.	tics didactics for Gyn s discussion of possi	nasium using the ex bilities of implemen	xamples of analytic geometry and tation in the classroom, also in-
Intend	ed lear	ning outcomes			
The stu fields c ceptior matics	Ident is of analy n of ma , maste	acquainted with basic m tic geometry and stochas thematical topics, He/Sh rs different strategies for	nathematical ways of stics in Sekundarstuf e knows important as teaching and learnin	thinking and workin e I) and is able to tal spects of planning a g und can assess th	g techniques (in particular in the ke into account the students'per- nd analysing teaching of mathe- em.
Course	S (type, r	number of weekly contact hours, l	anguage — if other than Ger	man)	
V (no ir	nformat	tion on SWS (weekly cont	act hours) and cours	e language available	e)
Metho module is	d of ass s creditab	sessment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
a) writt or c) or ges) or Assess	en exa al exan e) proj ment o	mination (approx. 60 min nination in groups (group ect (as specified at the b ffered: every two years, s	utes) or b) oral exam is of 3, approx. 30 mi eginning of the cours ummer semester	ination of one candi nutes) or d) written e e)	date each (approx. 15 minutes) elaboration (approx. 5 to 10 pa-
Allocat	ion of p	olaces			
Additio	onal inf	ormation			
Worklo	ad				
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module	Module appears in				
First st	ate exa	mination for the teaching	g degree Gymnasium	Mathematics (2012)	
First st	ate exa	mination for the teaching	g degree Gymnasium	Mathematics (2009)	

Advarue Joint Sector Sect	Module title					Abbreviation	
Module correction Module offered by Dean of Studies Mathematik (Mathematik (Mathematics) Institute of Mathematics ECTS Method of grading Only after succ. completed Image: Studies of Studies o	Advance	Advanced Didactics of Mathematics (German Gymnasium) 10-M-DVGY-092-m01					
Dean of Studies Mathematik (Mathematics) Institute of Mathematics ECTS Metro f grading Only after succ. compl. of module(s) 2 (not) = secsifully completed Duration Modue level Other prerequisites 1 semester undergraduate Contents Discussion of topics in teaching mathematics in a Gymnasium taking into account different aspects, in particular mathematics in doudations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intended teaming subject-specific, didactical and methodical aspects. Courses (type, number of weekly contact hours, language – if other than German) S S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) Ialk (approx. 6c on intures) Additional information Additional information regulations for teaching-degree programmes) Freed: In LPO I (examination regu	Module	coord	inator		Module offered by		
ECTS Metwork organing Only after succ. compl. of module(s) 2 (not) successfully completed Duration Module level Other prerequisites 1 semester undergraduate Conterstermatical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intermatical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intermatical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intermatical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intermatical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intermatical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intermatical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intermatical foundations (didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intermatical foundations, didactic and velocies and issues on teaching mathematics didactics as well as possible approaches in the classroom. Intermatical foundations (guadap	Dean of	Studie	es Mathematik (Mathema	atics)	Institute of Mathem	atics	
2 (not) successfully completed Module level Other prerequisites 1 sem ≤ter undergraduate Contents Discussion of topics in teaching mathematics in a Gymnasium taking into account different aspects, in particular mathematical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intended learning outcomes The student is able to discuss central topics and issues on teaching mathematics in high school (German Gymnasium), considering subject-specific, didactical and methodical aspects. Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) Latk (aptrox. 60 minutes) Additional information Contender det in LPO 1 (examination regulations for teaching degree programmes)	ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)		
Duration Module level Other prerequisites 1 semester undergraduate Contents Discussion of topics in teaching mathematics in a Gymnasium taking into account different aspects, in particular mathematical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intended learning outcomes The student is able to discuss central topics and issues on teaching mathematics in high school (German Gymnasium), considering subject-specific, didactical and methodical aspects. Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) Assessment offered: once a year, summer semester Allocation of places Additional information Teaching cycle	2	(not) s	successfully completed				
n semester undergraduate	Duratio	n	Module level	Other prerequisites			
Contents Discussion of topics in teaching mathematics in a Gymnasium taking into account different aspects, in particular mathematical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intended learning outcomes Intended learning subject-specific, didactical and methodical aspects. Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: once a year, summer semester Allocation of places Additional information Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2012)	1 semes	ster	undergraduate				
Discussion of topics in teaching mathematics in a Gymnasium taking into account different aspects, in particu- lar mathematical foundations, didactic analyses, contemporary discussions in mathematics didactics as well as possible approaches in the classroom. Intended learning outcomes The student is able to discuss central topics and issues on teaching mathematics in high school (German Gym- nasium), considering subject-specific, didactical and methodical aspects. Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: once a year, summer semester Allocation of places 	Content	S					
Intended learning outcomes The student is able to discuss central topics and issues on teaching mathematics in high school (German Gym- nasium), considering subject-specific, didactical and methodical aspects. Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: once a year, summer semester Allocation of places Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Discuss lar math possible	ion of nemati e appro	topics in teaching mathe cal foundations, didactic paches in the classroom.	matics in a Gymnasiı analyses, contempo	um taking into accou rary discussions in r	nt different aspects, in particu- nathematics didactics as well as	
The student is able to discuss central topics and issues on teaching mathematics in high school (German Gym- nasium), considering subject-specific, didactical and methodical aspects. Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: once a year, summer semester Allocation of places Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Intende	d learr	ning outcomes				
Courses (type, number of weekly contact hours, language – if other than German) S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: once a year, summer semester Allocation of places Additional information Workload Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	The stuc nasium)	dent is), cons	able to discuss central to discuss central to idering subject-specific,	opics and issues on t didactical and metho	eaching mathemation dical aspects.	cs in high school (German Gym-	
S (no information on SWS (weekly contact hours) and course language available) Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: once a year, summer semester Allocation of places Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Courses	i (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus) talk (approx. 60 minutes) Assessment offered: once a year, summer semester Allocation of places Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	S (no in	format	ion on SWS (weekly cont	act hours) and cours	e language available	2)	
talk (approx. 60 minutes) Assessment offered: once a year, summer semester Allocation of places Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Method module is	of ass creditab	essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether	
Allocation of places Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	talk (ap Assessr	prox. 6 nent o	o minutes) ffered: once a year, sumr	ner semester			
Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Allocati	on of p	olaces				
Additional information Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)							
Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Additio	nal info	ormation				
Workload Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)							
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Workloa	ad					
Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)							
Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Teachin	g cycl	9				
Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)							
 Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Referred to in LPO I (examination regulations for teaching-degree programmes)						
Module appears in First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)							
First state examination for the teaching degree Gymnasium Mathematics (2012) First state examination for the teaching degree Gymnasium Mathematics (2009)	Module appears in						
	First sta First sta	te exa te exa	mination for the teaching mination for the teaching	degree Gymnasium degree Gymnasium	Mathematics (2012) Mathematics (2009)		

Module title			Abbreviation		
Hands-on Mathematics			10-M-PRM-092-m01		
Module	e coord	inator		Module offered by	
Dean o	f Studie	es Mathematik (Mathema	atics)	Institute of Mathem	atics
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)	
8	nume	rical grade			
Duratio	n	Module level	Other prerequisites		
2 seme	ster	undergraduate			
Conten	ts				
Elaboration and implementation of a school project on a topic in mathematics, e. g. for project days, school term papers (Facharbeiten), Pluskurse (additional courses for the in-depth study of areas of special interest), work-shops. In the theoretical phase, the students formulate the subject-specific and didactic requirements of the topic, search for a suitable topic, elaborate this topic for the project and draw up a project plan. This is done in groups with students providing each other with advice as well as challenging and reflecting on each other's work. In the practical phase, the students prepare the implementation of the project, implement the project with pupils and afterwards reflect the planning and implementation. Intended learning outcomes The student ias able to select a suitable mathematical topic for a school project and elaborate it. He/She is acquainted with different spects of project planning and management, and can critically reflect the process. Courses (type, number of weekly contact hours, language – if other than German) P + S (no information on SWS (weekly contact hours) and course language available)					
with pu	ipils (ty	pe and expenditure of tir	ne to be specified by	the lecturer at the b	eginning of the course)
Allocat	ion of p	olaces			
Additio	nal info	ormation			
Worklo	ad				
Teachi	ig cycl	8			
KETEFIED TO IN LPUI (examination regulations for teaching-degree programmes)					
Module	20002	urs in			
First sta	ate exa	mination for the teaching	degree Gymnasium	Mathematics (2000)	
This state examination for the teaching degree dynnasium Mathematics (2009)					

Module title			Abbreviation			
E-Lear	E-Learning and Blended Learning in Mathematics at school 10-M-DVHB-092-m01					
Modul	e coord	inator		Module offered by		
Dean c	of Studio	es Mathematik (Mather	natics)	tics) Institute of Mathematics		
ECTS	Metho	od of grading	Only after succ. com	npl. of module(s)		
3	(not) s	successfully completed				
Duratio	on	Module level	Other prerequisites			
District levelDistrict prerequisites1 semesterundergraduateCertain prerequisites must be met to qualify for admission to a sessment. The lecturer will inform students about the respectiv at the beginning of the course. Registration for the course will sidered a declaration of will to seek admission to assessment. dents have obtained the qualification for admission to assess the course of the semester, the lecturer will put their registratio sessment into effect. Students who meet all prerequisites will ted to assessment at a later date, students will have to obtain the quali for admission to assessment anew. Courses offered online by Hochschule Bayern (vhb) in the field of mathematics are alway porated into a module with an exercise. The respective module identified by the word virtuell (online) added in brackets. Regis the exercise must always be made via SB@Home at the begin course. This registration for the exercise will be considered a d of will to seek admission to assessment. If the exercise was su ly completed, the lecturer will put the registration for assessment			as- tive details ll be con- nt. If stu- sement over ition for as- ill be admit- ster. For as- alification by Virtuelle rays incor- ules can be gistration for inning of the a declaration successful- ment into ef-			
Conter	nts					
In a co technio	urse off ques in	ered by Virtuelle Hochs e-learning and blended	schule Bayern (vhb), th d learning for teaching	e student becomes a mathematics.	acquainted with and	reflects on
Intend	ed lear	ning outcomes				
The stu well as	udent is their p	acquainted with basic otentials and limitation	methods of e-learning is.	and blended learnin	g in teaching methe	matics, as
Course	S (type, r	number of weekly contact hour	s, language — if other than Ger	man)		
Ü (no i	nformat	tion on SWS (weekly co	ntact hours) and cours	e language available	2)	
Metho module i	d of ass s creditab	Sessment (type, scope, lang le for bonus)	uage — if other than German, e	examination offered — if no	t every semester, informati	on on whether
web-ba course	ased pr	oject assignments and	tests (length/expendit	ure of time to be ann	ounced at the begin	ining of the
Allocat	tion of r	olaces				
Additio	onal inf	ormation				
Worklo	ad					
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
LA Gymnas	sien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	ik - 2009	page 66 / 77



Module appears in

First state examination for the teaching degree Grundschule Mathematics (2009)

First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2009) First state examination for the teaching degree Hauptschule Mathematics (2009)

First state examination for the teaching degree Hauptschule Didactics in Mathematics (Secondary School) (2009) First state examination for the teaching degree Realschule Mathematics (2009)

First state examination for the teaching degree Gymnasium Mathematics (2012)

First state examination for the teaching degree Gymnasium Mathematics (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Secondary School) (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2013)

First state examination for the teaching degree Mittelschule Mathematics (2013)

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2013)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 67 / 77
	data record Lehramt Gymnasien Mathematik - 2009	

Module title					Abbreviation	
Stocha	Stochastics in Sekundarstufe I (virtual course)				10-M-VHBSto-092-r	no1
Module	e coord	inator		Module offered by		
Dean o	f Studi	es Mathematik (Mather	natics)	Institute of Mathem	atics	
ECTS Method of grading Only		Only after succ. com	npl. of module(s)			
3	(not) s	successfully completed				
Duratio	n	Module level	Other prerequisites			
1 seme	ster	undergraduate	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective deta at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment of the course of the semester, the lecturer will put their registration for a sessment into effect. Students who meet all prerequisites will be adm ted to assessment in the current or in the subsequent semester. For a sessment at a later date, students will have to obtain the qualification for admission to assessment anew. Courses offered online by Virtuell Hochschule Bayern (vhb) in the field of mathematics are always incor porated into a module with an exercise. The respective modules can be identified by the word virtuell (online) added in brackets. Registration the exercise must always be made via SB@Home at the beginning of course. This registration for the exercise will be considered a declarat of will to seek admission to assessment. If the exercise was successf ly completed, the lecturer will put the registration for assessment into			as- tive details ll be con- nt. If stu- sement over tion for as- til be admit- ster. For as- alification by Virtuelle ays incor- ules can be gistration for nning of the declaration successful- ment into ef-
Conten	ts					
Revisio fic and	n and o didacti	consolidation of the fur ic courses in stochastic	idamental topics in sto s.	chastics that are pre	erequisites for the su	bject-speci-
Intende	ed lear	ning outcomes				
The stu tics.He,	dent h /She is	as basic knowledge of a acquainted with the e	stochastics, as required nployment of new tech	d for the study of ma nologies for teachin	thematics and its di g stochastics in scho	dac- pol.
Course	S (type, r	umber of weekly contact hour	s, language — if other than Ger	man)		
Ü (no ir	nformat	tion on SWS (weekly co	ntact hours) and cours	e language available	2)	
Methoo module is	d of ass creditab	s essment (type, scope, lang le for bonus)	uage — if other than German, e	examination offered — if no	t every semester, informati	on on whether
web-ba course)	sed pr	oject assignments and	tests (length/expendit	ure of time to be ann	ounced at the begin	ning of the
Allocat	ion of p	olaces				
Additio	nal inf	ormation				
Workload						
Teaching cycle						
Referred to in LPO I (examination regulations for teaching-degree programmes)						
LA Gymnasi	ien Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e chramt Gymnasien Mathemat	exam. reg. ik - 2009	page 68 / 77

Module appears in

First state examination for the teaching degree Hauptschule Mathematics (2009)

First state examination for the teaching degree Hauptschule Didactics in Mathematics (Secondary School) (2009) First state examination for the teaching degree Realschule Mathematics (2009)

First state examination for the teaching degree Gymnasium Mathematics (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Secondary School) (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2013)

First state examination for the teaching degree Mittelschule Mathematics (2013)

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2013)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 69 / 77
	data record Lehramt Gymnasien Mathematik - 2009	



Module	title				Abbreviation		
Basics	in Arith	metics (virtual course			10-M-VHBAri-092-m	101	
Module	coord	inator		Module offered by	Module offered by		
Dean of	f Studie	es Mathematik (Mathe	natics)	Institute of Mathem	atics		
ECTS	Metho	od of grading	Only after succ. com	pl. of module(s)			
3	(not) s	successfully completed					
Duratio	n	Module level	Other prerequisites				
1 semes	ster	undergraduate	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew. Courses offered online by Virtuelle Hochschule Bayern (vhb) in the field of mathematics are always incor- porated into a module with an exercise. The respective modules can be identified by the word virtuell (online) added in brackets. Registration for the exercise must always be made via SB@Home at the beginning of the course. This registration for the exercise will be considered a declaration of will to seek admission to assessment. If the exercise was successful- ly completed, the lecturer will put the registration for assessment into ef-				
Conton			fect at the end of the	e course.			
Basic to	nics o	n teaching arithmetics	in school e g divisabi	ility theory prime nu	mbers set theory		
Intende	ed lear	ning outcomes		inty theory, prine ne	inibers, set theory.		
The stu proofs.	dent le He/Sh	arns basic topics in the e is acquainted with the	e teaching of arithmetic e employment of new t	s and the related ma echnologies for teac	athematical backgro hing arithmetic in sc	unds and hool.	
Courses	S (type, n	umber of weekly contact hour	s, language — if other than Ger	man)			
Ü (no in	offormat	ion on SWS (weekly co	ntact hours) and cours	e language available	2)		
Method module is	l of ass	e essment (type, scope, lang le for bonus)	uage — if other than German, e	examination offered — if no	t every semester, informati	on on whether	
course)	seu pro	oject assignments and		are of time to be and	iounced at the begin	ning of the	
Allocati	ion of p	olaces					
Additio	nal inf	ormation					
Workload							
Referred to in LPO I (examination regulations for teaching-degree programmes)							
Module	appea	irs in					
LA Gymnasi	en Mathe	matics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e hramt Gymnasien Mathemat	exam. reg. ik - 2009	page 70 / 77	

First state examination for the teaching degree Grundschule Mathematics (2009) First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2009) First state examination for the teaching degree Hauptschule Mathematics (2009) First state examination for the teaching degree Hauptschule Didactics in Mathematics (Secondary School) (2009)

First state examination for the teaching degree Realschule Mathematics (2009)

First state examination for the teaching degree Gymnasium Mathematics (2009)

UNIVERSITÄT

WÜRZBURG

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Secondary School) (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2013)

First state examination for the teaching degree Mittelschule Mathematics (2013)

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2013)

		1
LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	page 71 / 77
	data record Labrant Gympasian Mathematik 2000	
	uala lecolu Lemani dynnasien Malnenalk - 2009	



Module title					Abbreviation	
Basics in School Geometry (virtual course)					10-M-VHBGeo-092-m01	
Module coordinator				Module offered by		
Dean of Studies Mathematik (Mathema			atics) Institute of Mathematics			
ECTS	ECTS Method of grading		Only after succ. com	Only after succ. compl. of module(s)		
3	(not) s	successfully completed				
Duration Module		Module level	Other prerequisites			
1 semester		undergraduate	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew. Courses offered online by Virtuelle Hochschule Bayern (vhb) in the field of mathematics are always incor- porated into a module with an exercise. The respective modules can be identified by the word virtuell (online) added in brackets. Registration for the exercise must always be made via SB@Home at the beginning of the course. This registration for the exercise will be considered a declaration of will to seek admission to assessment. If the exercise was successful- ly completed, the lecturer will put the registration for assessment into ef- fect at the end of the course.			
Contents						
Revision and consolidation of the fundamental topics in elementary geometry that are prerequisites for the sub- ject-specific and didactic courses (in particular teaching degrees Grundschule, Hauptschule, Realschule) in geo- metry.						
Intended learning outcomes						
The student has basic knowledge of school geometry, as required for the study of mathematics and its didac- tics.He/She is acquainted with the employment of new technologies for teaching geometry in school.						
Courses (type, number of weekly contact hours, language — if other than German)						
U (no information on SWS (weekly contact hours) and course language available)						
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)						
web-based project assignments and tests (length/expenditure of time to be announced at the beginning of the course)						
Allocation of places						
Additional information						
Workload						
Teaching cycle						
Reterred to in LPO I (examination regulations for teaching-degree programmes)						
						· · · · · · · · · · · · · · · · · · ·
LA Gymnasien mathematics (2009) JMU Wurzburg • generated 26-Aug-2024 • exam. reg. page 72 / 7 data record Lehramt Gymnasien Mathematik - 2009 gage 72 / 7						
Module appears in

First state examination for the teaching degree Grundschule Mathematics (2009) First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2009) First state examination for the teaching degree Hauptschule Mathematics (2009) First state examination for the teaching degree Hauptschule Didactics in Mathematics (Secondary School) (2009) First state examination for the teaching degree Realschule Mathematics (2009)

First state examination for the teaching degree Gymnasium Mathematics (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Secondary School) (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2013)

First state examination for the teaching degree Mittelschule Mathematics (2013)

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2013)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	
	data record Lehramt Gymnasien Mathematik - 2009	



Module title			Abbreviation				
Mathematics in Class 10 (virtual course)			10-M-VHBM10-092-	·m01			
Module coordinator			Module offered by				
Dean of Studies Mathematik (Mathema		natics)	atics) Institute of Mathematics				
ECTS Method of grading		Only after succ. con	Only after succ. compl. of module(s)				
3	(not) s	successfully completed					
Duratio	on	Module level	Other prerequisites	Other prerequisites			
1 semester undergraduate		Certain prerequisite sessment. The lectu at the beginning of t sidered a declaratio dents have obtained the course of the se sessment into effect ted to assessment it sessment at a later for admission to ass Hochschule Bayern porated into a modu identified by the wo the exercise must al course. This registra of will to seek admis ly completed, the le fect at the end of the	Certain prerequisites must be met to qualify for admission to as- sessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be con- sidered a declaration of will to seek admission to assessment. If stu- dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for as- sessment into effect. Students who meet all prerequisites will be admit- ted to assessment in the current or in the subsequent semester. For as- sessment at a later date, students will have to obtain the qualification for admission to assessment anew. Courses offered online by Virtuelle Hochschule Bayern (vhb) in the field of mathematics are always incor- porated into a module with an exercise. The respective modules can be identified by the word virtuell (online) added in brackets. Registration for the exercise must always be made via SB@Home at the beginning of the course. This registration for the exercise will be considered a declaration of will to seek admission to assessment. If the exercise was successful- ly completed, the lecturer will put the registration for assessment into ef-				
Conten	its						
Basic t	opics o	n teaching mathematic	s in tenth grade in Hau	ptschule, Realschul	e and Gymnasium.		
Intende	ed lear	ning outcomes					
The stu schule, of new	ident le , as wel techno	earns basic topics in the ll as the related mather logies for teaching mat	e teaching of mathema natical backgrounds ar hematics in tenth form	tics in tenth form at and proofs. He/She is .	German Mittelschule acquainted with the	e and Real- e employment	
Course	S (type, r	number of weekly contact hour	s, language — if other than Ger	rman)			
Ü (no ir	nforma	tion on SWS (weekly co	ntact hours) and cours	e language available	e)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)							
web-based project assignments and tests (length/expenditure of time to be announced at the beginning of the course)							
Allocation of places							
Additional information							
Workload							
Teachi	ng cycl	e					
	_						
Referre	ed to in	LPO I (examination regulation	ons for teaching-degree progra	mmes)			
LA Gymnas	ien Mathe	ematics (2009)	JMU Würzburg data record Le	• generated 26-Aug-2024 • e ehramt Gymnasien Mathemat	exam. reg. ik - 2009	page 74 / 77	

Module appears in

First state examination for the teaching degree Hauptschule Mathematics (2009)

First state examination for the teaching degree Hauptschule Didactics in Mathematics (Secondary School) (2009) First state examination for the teaching degree Realschule Mathematics (2009)

First state examination for the teaching degree Gymnasium Mathematics (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Secondary School) (2009)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2013)

First state examination for the teaching degree Mittelschule Mathematics (2013)

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2013)

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	
	data record Lehramt Gymnasien Mathematik - 2009	





Thesis

(10 ECTS credits)

Preparation of a written Hausarbeit (thesis) in accordance with the provisions of Section 29 LPO I (examination regulations for teaching-degree programmes) is a prerequisite for teaching degree students to be admitted to the Erste Staatsprüfung (First State Examination). In accordance with the provisions of Section 29 LPO I, students studying for a teaching degree Gymnasium may write this thesis in one of the subjects they selected as vertieft studiertes Fach (subject studied with a focus on the scientific discipline) or in the subject Erziehungswissenschaften (Educational Science). Pursuant to Section 29 Subsection 1 Sentence 2 LPO I, students may also choose to write an interdisciplinary thesis.

LA Gymnasien Mathematics (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg.	
	data record Lehramt Gymnasien Mathematik - 2009	

Module title				Abbreviation	
Thesis in Mathematics (teaching degree at German Gymnasium)			10-M-HMGY-092-m01		
Module coordinator				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 numerical grade			Where applicable, specific modules/module components as specified by supervisor.		
Duratio	n	Module level	Other prerequisites		
1 seme	ster	undergraduate			
Conten	ts				
Independently researching and writing on a topic in mathematics or mathematics didactics selected in consulta- tion with the supervisor.					
Intende	ed leari	ning outcomes			
The student is able to work independently on a given mathematical topic and apply the skills and methods ob- tained during his/her studies in the teaching degree programme. He/She can write down the result of his/her work in a suitable form, incorporating aspects of the didactics of mathematics.					
Course	S (type, n	umber of weekly contact hours, l	anguage — if other than Ger	man)	
no cour	rses as	signed			
Methoo module is	d of ass creditab	s essment (type, scope, langua le for bonus)	ge — if other than German, e	examination offered — if no	t every semester, information on whether
written thesis (approx. 250 to 300 hours total) Language of assessment: German, exceptions in accordance with Section 29 Subsection 4 LPO I (examination re- gulations for teaching degree programmes)					
Allocat	ion of p	olaces			
Additio	nal inf	ormation			
Additional information on module duration: 1 to 2 semesters.					
Workload					
Teaching cycle					
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					
First sta	First state examination for the teaching degree Gymnasium Mathematics (2012)				
rist state examination for the teaching degree Gymnasium Mathematics (2009)					