Module Catalogue

for the Subject

Didactics in Mathematics (Primary School)

as Didaktikfach

with the degree "Erste Staatsprüfung für das Lehramt an Grundschulen"

Examination regulations version: 2009
Responsible: Institute of Mathematics

Contents

The subject is divided into

section / sub-section	ECTS credits	starting page
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Freier Bereich (general as well as subject-specific electives)		11
Thesis	10	20

Abbreviations used

Course types: **E** = field trip, **K** = colloquium, **O** = conversatorium, **P** = placement/lab course, **R** = project, **S** = seminar, **T** = tutorial, **Ü** = exercise, **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)):

> **23-May-2012 (2012-82)**

> **25-Sep-2014 (2014-65)**

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.

Compulsory Courses

(10 ECTS credits)

Successful completion of modules worth no less than 10 ECTS credits in each subject selected as Didaktikfach (subject studied with a focus on teaching methodology) (mandatory courses) is a prerequisite for admission to the Erste Staatsprüfung (First State Examination) in the subject Didaktik der Grundschule (Didactics for Grundschule). In addition, modules worth another 5 ECTS credits must be successfully completed in one of the subjects selected as Didaktikfach (mandatory electives).

Module title		Abbreviation
Mathematics in German Grundschule (Arithmetic, Geometry and Application of Mathematics)		10-M-MGS-092-m01

Module coordinator	Module offered by
Dean of Studies Mathematik (Mathematics)	Institute of Mathematics

ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--

Duration	Module level	Other prerequisites
2 semester	undergraduate	--

Contents

Discussion of central topics in teaching mathematics in Grundschule taking into account subject-specific and didactic aspects as well as possibilities of implementation in the classroom, also including modern technologies.

Intended learning outcomes

The student is acquainted with the mathematical basics of elementary school mathematics and can explain them. He/She knows about the objectives of teaching mathematics in elementary school, fundamentals of developmental psychology and didactics of mathematics, as well as important models, presentations and media which can be employed in teaching mathematics in elementary school. She/he knows about common difficulties and problems of pupils in the acquisition of mathematical skills, and can employ didactical principles and teaching and learning strategies.

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-MGS-P-092: M (no information on SWS (weekly contact hours) and course language available)
- 10-M-MGS-1-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-MGS-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-MGS-P-092: Mathematics in German Grundschule (Exam in Arithmetic, Geometry and Application of Mathematics)
- 1 ECTS, Method of grading: numerical grade
- written examination (approx. 120 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 15 minutes) or an oral examination in groups (groups of 2: approx. 20 minutes, groups of 3: approx. 30 minutes) or by a written and/or multi-media portfolio (as announced)
- Only after successful completion of module components: Successful completion of the two module components 10-M-MGS-1 and 10-M-MGS-2 is a prerequisite for participation in module component 10-M-MGS-P.

Assessment in module component 10-M-MGS-1-092: Mathematics in German Grundschule (Arithmetic) Mathematics in German Grundschule (Arithmetic)
- 5 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 successfully completed over the course of the semester for the module component to be considered successfully completed.

Assessment in module component 10-M-MGS-2-092: Mathematics in German Grundschule (Geometry and Application of Mathematics) Mathematics in German Grundschule (Geometry and Application of Mathematics)
- 4 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 successfully completed over the course of the semester for the module component to be considered successfully completed.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

§ 36 (1) 7. Didaktik der Grundschule Mathematik

Module appears in

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

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

Compulsory Electives

(ECTS credits)

Module title		Abbreviation
Selected Topics in Didactics of Mathematics (German Grundschule)		10-M-DAGS-092-m01

Module coordinator	Module offered by
Dean of Studies Mathematik (Mathematics)	Institute of Mathematics

ECTS	Method of grading	Only after succ. compl. of module(s)
2	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

Discussion of basic topics in mathematics didactics with a focus on didactic aspects (e. g. dyscalculia, evaluation of teaching materials for mathematics in Grundschule, using computers for teaching mathematics in Grundschule, selected topics and research results in modern mathematics didactics, theoretical foundations of mathematics didactics, dealing with heterogeneity in the classroom, organising substantial learning environments).

Intended learning outcomes

The student is acquainted with theoretical concepts in the didactics of mathematics, knows important aspects of planning and analysing teaching of mathematics, masters different strategies for teaching and learning und can assess and employ them.

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)

a) talk (approx. 60 minutes) or b) project (approx. 5 to 15 pages) or c) portfolio (approx. 5 to 15 pages)
Assessment offered: once a year, winter semester

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

§ 36 (1) 7. Didaktik der Grundschule Mathematik

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 Sonderpädagogik Didactics in Mathematics (Primary School) (2009)

Module title		Abbreviation
Methodology of Teaching in Mathematics (German Grundschule)		10-M-DMGS-092-m01

Module coordinator	Module offered by
Dean of Studies Mathematik (Mathematics)	Institute of Mathematics

ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

Discussion of topics in the methodology of teaching mathematics; e. g. support for pupils who are particularly weak or particularly strong in mathematics, dealing with heterogeneity in the classroom, organisation of substantial learning environments as well as possibilities of implementation in the classroom, also including modern technologies.

Intended learning outcomes

The student knows about possibilities to promote mathematical skills, criteria für assessing media and their use in teaching mathematics and important aspects in planning and analysing the teaching of mathematics. He/She is acquainted with learning and teaching strategies and can employ and assess them.

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)

a) talk (approx. 45 minutes) or b) project (approx. 5 to 15 pages) or c) portfolio (approx. 5 to 15 pages)
Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

§ 36 (1) 7. Didaktik der Grundschule Mathematik

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 Sonderpädagogik Didactics in Mathematics (Primary School) (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".

Module title		Abbreviation
Selected Topics in Didactics of Mathematics (German Grundschule)		10-M-DAGS-092-m01

Module coordinator	Module offered by
Dean of Studies Mathematik (Mathematics)	Institute of Mathematics

ECTS	Method of grading	Only after succ. compl. of module(s)
2	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

Discussion of basic topics in mathematics didactics with a focus on didactic aspects (e. g. dyscalculia, evaluation of teaching materials for mathematics in Grundschule, using computers for teaching mathematics in Grundschule, selected topics and research results in modern mathematics didactics, theoretical foundations of mathematics didactics, dealing with heterogeneity in the classroom, organising substantial learning environments).

Intended learning outcomes

The student is acquainted with theoretical concepts in the didactics of mathematics, knows important aspects of planning and analysing teaching of mathematics, masters different strategies for teaching and learning und can assess and employ them.

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)

a) talk (approx. 60 minutes) or b) project (approx. 5 to 15 pages) or c) portfolio (approx. 5 to 15 pages)
Assessment offered: once a year, winter semester

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

§ 36 (1) 7. Didaktik der Grundschule Mathematik

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 Sonderpädagogik Didactics in Mathematics (Primary School) (2009)

Module title		Abbreviation
Methodology of Teaching in Mathematics (German Grundschule)		10-M-DMGS-092-m01

Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics

ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

Discussion of topics in the methodology of teaching mathematics; e. g. support for pupils who are particularly weak or particularly strong in mathematics, dealing with heterogeneity in the classroom, organisation of substantial learning environments as well as possibilities of implementation in the classroom, also including modern technologies.

Intended learning outcomes

The student knows about possibilities to promote mathematical skills, criteria für assessing media and their use in teaching mathematics and important aspects in planning and analysing the teaching of mathematics. He/She is acquainted with learning and teaching strategies and can employ and assess them.

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)

a) talk (approx. 45 minutes) or b) project (approx. 5 to 15 pages) or c) portfolio (approx. 5 to 15 pages)
Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

§ 36 (1) 7. Didaktik der Grundschule Mathematik

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 Sonderpädagogik Didactics in Mathematics (Primary School) (2009)

Module title		Abbreviation
E-Learning and Blended Learning in Mathematics at school		10-M-DVHB-092-m01

Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics

ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	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. Courses offered online by Virtuelle Hochschule Bayern (vhb) in the field of mathematics are always incorporated 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 successfully completed, the lecturer will put the registration for assessment into effect at the end of the course.

Contents

In a course offered by Virtuelle Hochschule Bayern (vhb), the student becomes acquainted with and reflects on techniques in e-learning and blended learning for teaching mathematics.

Intended learning outcomes

The student is acquainted with basic methods of e-learning and blended learning in teaching methematics, as well as their potentials and limitations.

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

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)

web-based project assignments and tests (length/expenditure of time to be announced at the beginning of the course)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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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)

Module title		Abbreviation
Basics in Arithmetics (virtual course)		10-M-VHBAri-092-m01

Module coordinator	Module offered by
Dean of Studies Mathematik (Mathematics)	Institute of Mathematics

ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	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. Courses offered online by Virtuelle Hochschule Bayern (vhb) in the field of mathematics are always incorporated 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 successfully completed, the lecturer will put the registration for assessment into effect at the end of the course.

Contents

Basic topics on teaching arithmetics in school, e. g. divisability theory, prime numbers, set theory.

Intended learning outcomes

The student learns basic topics in the teaching of arithmetics and the related mathematical backgrounds and proofs. He/She is acquainted with the employment of new technologies for teaching arithmetic in school.

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

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)

web-based project assignments and tests (length/expenditure of time to be announced at the beginning of the course)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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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)

Module title	Abbreviation
Basics in School Geometry (virtual course)	10-M-VHBGeo-092-m01

Module coordinator	Module offered by
Dean of Studies Mathematik (Mathematics)	Institute of Mathematics

ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	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. Courses offered online by Virtuelle Hochschule Bayern (vhb) in the field of mathematics are always incorporated 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 successfully completed, the lecturer will put the registration for assessment into effect at the end of the course.

Contents

Revision and consolidation of the fundamental topics in elementary geometry that are prerequisites for the subject-specific and didactic courses (in particular teaching degrees Grundschule, Hauptschule, Realschule) in geometry.

Intended learning outcomes

The student has basic knowledge of school geometry, as required for the study of mathematics and its didactics.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)

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)

web-based project assignments and tests (length/expenditure of time to be announced at the beginning of the course)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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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)

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 Grundschule may write this thesis in the subject Didaktik der Grundschule (Didactics of Grundschule), in the subject they selected as Unterrichtsfach (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.

Module title		Abbreviation
Thesis in Mathematics (teaching degree at German Grundschule)		10-M-HMGSD-092-m01

Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics

ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	Where applicable, specific modules/module components as specified by supervisor.

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

Independently researching and writing on a topic in mathematics or mathematics didactics selected in consultation with the supervisor.

Intended learning outcomes

The student is able to work independently on a given mathematical topic and apply the skills and methods obtained 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.

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

no courses assigned

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

written thesis (approx. 250 to 300 hours total)
Language of assessment: German, exceptions in accordance with Section 29 Subsection 4 LPO I (examination regulations for teaching degree programmes)

Allocation of places

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Additional information

Additional information on module duration: 1 to 2 semesters.

Workload

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Teaching cycle

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

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Module appears in

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