Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

# Module Catalogue

for the Subject

# Didactics in Mathematics (Primary School)

as Didaktikfach

with the degree "Erweiterungsprüfung für das Lehramt für Sonderpädagogik"

( ECTS credits)

Examination regulations version: 2015
Responsible: Faculty of Mathematics and Computer Science
Responsible: Institute of Mathematics

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# The subject is divided into


| section / sub-section | ECTS credits | starting page |
|---|---|---|
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# 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:

**LASPO2015**

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

**05-Oct-2015 (2015-187)**

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.

# Area 1

(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 - Arithmetics** | | | 10-M-MGS1-152-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)** | |
| 5 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 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)

V (2) + Ü (2)

**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 examination (approx. 60 to 90 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
creditable for bonus

**Allocation of places**

--

**Additional information**

--

**Workload**

150 h

**Teaching cycle**

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

§ 36 I Nr. 7

| Module title | | | Abbreviation |
|---|---|---|---|
| **Mathematics in German Grundschule - Geometry and Application of Mathematics** | | | 10-M-MGS2-152-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)** | |
| 5 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 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)

V (2) + Ü (2)

**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 examination (approx. 60 to 90 minutes)
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
creditable for bonus

**Allocation of places**

--

**Additional information**

--

**Workload**

150 h

**Teaching cycle**

--

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

§ 36 I Nr. 7

## Area 2

(0 or 5 ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Didactics and Methology of Teaching Mathematics** | | | 10-M-MGS3-152-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)** | |
| 5 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 2 semester | undergraduate | -- | |

**Contents**

Discussion of basic topics in mathematics didactics and the methodology of teaching mathematics with a focus on didactic aspects (e. g. support for pupils who are particularly weak or particularly strong in mathematics, 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 and possibilities to promote mathematical skills, 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 (2) + S (2)

**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) term paper (10 to 15 pages) or
c) project (15 to 25 pages)
Assessment offered: Once a year, winter semester

**Allocation of places**

--

**Additional information**

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**Workload**

150 h

**Teaching cycle**

--

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

§ 36 I Nr. 7

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

(0-15 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".

# Extra Skills Teaching Mathematics at the German Grundschule

( ECTS credits)

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

| Module title | | | Abbreviation |
|---|---|---|---|
| **Selected Topics in Didactics of Mathematics 1 (German Grundschule)** | | | 10-M-DAGS1-152-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 (2)

**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) term paper (5 to 10 pages) or
c) project (10 to 15 pages)
Assessment offered: Every two years, winter semester

**Allocation of places**

--

**Additional information**

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**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Methodology of Teaching in Mathematics 1 (German Grundschule)** | | | 10-M-DMGS1-152-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 (2)

**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) term paper (5 to 10 pages) or
c) project (10 to 15 pages)
Assessment offered: Every two years, winter semester

**Allocation of places**

--

**Additional information**

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**Workload**

90 h

**Teaching cycle**

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

§ 22 II Nr. 1 h)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Selected Topics in Didactics of Mathematics 2 (German Grundschule)** | | | 10-M-DAGS2-152-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 (2)

**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) term paper (5 to 10 pages) or
c) project (10 to 15 pages)
Assessment offered: Every two years, summer semester

**Allocation of places**

--

**Additional information**

--

**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Methodology of Teaching in Mathematics 2 (German Grundschule)** | | | 10-M-DMGS2-152-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 (2)

**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) term paper (5 to 10 pages) or
c) project (10 to 15 pages)
Assessment offered: Every two years, summer semester

**Allocation of places**

--

**Additional information**

--

**Workload**

90 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)

| Module title | | | Abbreviation |
|---|---|---|---|
| **E-Learning and Blended Learning in Mathematical Teaching (virtual Course)** | | | 10-M-DVHB-152-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**

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 (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, winter semester

**Allocation of places**

--

**Additional information**

--

**Workload**

90 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Basics in Arithmetics (virtual course)** | | | 10-M-VHBAri-152-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**

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 (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, winter semester

**Allocation of places**

--

**Additional information**

--

**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Basics in School Geometry (virtual course)** | | | 10-M-VHBGeo-152-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**

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 (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, summer semester

**Allocation of places**

--

**Additional information**

--

**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Stochastics in Sekundarstufe I (virtual course)** | | | 10-M-VHBSto-152-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**

Revision and consolidation of the fundamental topics in stochastics that are prerequisites for the subject-specific and didactic courses in stochastics.

**Intended learning outcomes**

The student has basic knowledge of stochastics, as required for the study of mathematics and its didactics.He/She is acquainted with the employment of new technologies for teaching stochastics in school.

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

Ü (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, winter semester

**Allocation of places**

--

**Additional information**

--

**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Mathematics in grade 10 (virtual course)** | | | 10-M-VHBM10-152-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**

Basic topics on teaching mathematics in tenth grade in Hauptschule, Realschule and Gymnasium.

**Intended learning outcomes**

The student learns basic topics in the teaching of mathematics in tenth form at German Mittelschule and Realschule, as well as the related mathematical backgrounds and proofs. He/She is acquainted with the employment of new technologies for teaching mathematics in tenth form.

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

Ü (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, summer semester

**Allocation of places**

--

**Additional information**

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**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Basics of Mathematics für German Grundschule 1: Arithmetics and Orders of Magnitude (virtual course)** | | | 10-M-VHBAuG-152-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**

Fundamental topics in teaching arithmetics in Grundschule, e. g. positional notation, elementary arithmetics, arithmetic laws, divisibility. Additional selected topics in application-oriented mathematics on the quantities covered in Grundschule.

**Intended learning outcomes**

The students know the subject-related contents in arithmetic in elementary school, and are able to structure the notions and methods within a conceptual map. They know the subject-related contents in application-oriented mathematics related to quantities, and are able to structure the notions and methods within a conceptual map. They know strategies for development of understanding of the central notions of arithmetic in elementary school. They are able to assess and value the importance of digital technology with respect to todays and future design of instruction. They know various fields of application of arithmetic concepts, and are able to perform modelling independently.

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

Ü (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, winter semester

**Allocation of places**

--

**Additional information**

--

**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Basics of Mathematics für German Grundschule 2: Geometry and Stochastics (virtual course)** | | | 10-M-VHBGuS-152-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**

Fundamental topics in teaching geometry (planar figures, solids, congruence and symmetry) and application-oriented mathematics (statistics, probability and combinatorics) in Grundschule.

**Intended learning outcomes**

The students know the subject-related contents in geometry in elementary school, and are able to structure the notions and methods within a conceptual map. They know the subject-related contents in application-oriented mathematics related to statistics, probability and combinatorics, and are able to structure the notions and methods within a conceptual map. They know strategies for development of understanding of the central notions of geometry and application-oriented mathematics in elementary school. They are able to assess and value the importance of digital technology with respect to todays and future design of instruction. They know various fields of application of geometry and application-oriented mathematics concepts, and are able to perform modelling independently.

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

Ü (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, summer semester

**Allocation of places**

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**Additional information**

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**Workload**

60 h

**Teaching cycle**

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

§ 22 II Nr. 1 h)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Didactics of Geometry (virtual course)** | | | 10-M-VHBDG-152-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**

Geometry didactics is about learning and teaching geometry. This course focuses on topics which are central and important for all of geometry and mathematics, namely proving and problem solving. It also addresses topics which are usually discussed only briefly or not at all in university lectures and in the literature. Among these are chapters on space geometry, trigonometry and similarity geometry.

**Intended learning outcomes**

The students are acquainted with the subject-specific contents of school geometry, and are able to structure the notions and methods within a conceptual map. They know strategies of short, middle and long term development of understanding of the central concepts of geometry in teaching mathematics. They are able to develop and justify learning units and learning sequences for the important topics in school geometry independently. They are able to assess and value the importance of digital technology with respect to todays and future design of instruction. They know various fields of application of geometric concepts, and are able to perform modelling (in the sense of modelling cycles) independently.

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

Ü (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, summer semester

**Allocation of places**

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**Additional information**

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**Workload**

60 h

**Teaching cycle**

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

§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Didactics of Algebra (virtual course)** | | | 10-M-VHBDA-152-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**

Algebra didactics is about learning and teaching algebra. This course focuses on the central and important topics in school algebra: extensions of number domains, variables and terms, equations and functions.

**Intended learning outcomes**

The students are acquainted with the subject-specific contents of school algebra, and are able to structure the notions and methods within a conceptual map. They know strategies of short, middle and long term development of understanding of the central concepts of algebra in teaching mathematics. They are able to develop and justify learning units and learning sequences for the important topics in school algebra independently. They are able to assess and value the importance of digital technology with respect to todays and future design of instruction. They know various fields of application of algebraic concepts, and are able to perform modelling (in the sense of modelling cycles) independently.

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

Ü (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, winter semester

**Allocation of places**

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**Additional information**

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**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h), § 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Exam Tutorial Didactics of Mathematics (virtual course)** | | | 10-M-VHBEx-152-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**

Revision of basics (definitions of mathematical notions, formulation and proving of theorems) in preparation for the Erstes Staatsexamen für Lehramt Gymnasium (first state examination for teaching at a Gymnasium) as well as basic guidelines for answering exam questions (with a special focus on the state examination in Bavaria).

**Intended learning outcomes**

The student learns about the structure of the state exams and different methods for solving the exam problems.

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

Ü (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, winter semester

**Allocation of places**

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**Additional information**

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**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Mathematics 1 (virtual course)** | | | 10-M-VHBMa1-152-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 on teaching mathematics in a Gymnasium, in particular verbal and subject-specific fundamentals concerning the organisation of classes.

**Intended learning outcomes**

The student is able to discuss selected topics and questions on teaching mathematics at German Gymnasium, considering both subject-related and methodical aspects.

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

Ü (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Every two years, winter semester

**Allocation of places**

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**Additional information**

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**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Mathematics 2 (virtual course)** | | | 10-M-VHBMa2-152-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 central topics on teaching mathematics in a Gymnasium, in particular didactic analyses and possibilities of implementation in the classroom.

**Intended learning outcomes**

The student is able to discuss and analyse selected topics and questions on teaching mathematics at German Gymnasium from a didactical point of view.

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

Ü (2)
Course type: eLearning, mostly Virtuelle Hochschule Bayern (vhb)

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

project (web-based, 15 to 20 hours)
Assessment offered: Every two years, summer semester

**Allocation of places**

--

**Additional information**

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**Workload**

60 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Methods and Media in Teaching Mathematics 1 (German Grundschule)** | | | 10-M-MMMG1-152-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**

Topics in the methodology of teaching mathematics (e. g. support for pupils who are particularly strong or particularly weak in mathematics, dealing with heterogeneity in the classroom, organisation of substantial learning environments) and the use of media in the classroom (e. g. real objects, the use of computers) are discussed with a focus on practical implementation in the classroom.

**Intended learning outcomes**

The student knows the possibilities, limitations, advantages and disadvantages of methods and media for employment in teaching mathematics.

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

S (2)

**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) term paper (5 to 10 pages) or
c) project (10 to 15 pages)
Assessment offered: Every two years, winter semester

**Allocation of places**

--

**Additional information**

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**Workload**

90 h

**Teaching cycle**

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

§ 22 II Nr. 1 h)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Methods and Media in Teaching Mathematics 2 (German Grundschule)** | | | 10-M-MMMG2-152-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**

Further topics in the methodology of teaching mathematics (e. g. learning materials, in-depth employment of media in the classroom) are discussed and tested in practice.

**Intended learning outcomes**

The student knows the possibilities, limitations, advantages and disadvantages of comprehensive methods and media for employment in teaching mathematics.

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

S (2)

**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) term paper (5 to 10 pages) or
c) project (10 to 15 pages)
Assessment offered: Every two years, summer semester

**Allocation of places**

--

**Additional information**

--

**Workload**

90 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)