# Subdivided Module Catalogue

for the Subject

# Mathematics

as Unterrichtsfach

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

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

# 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.

# The subject is divided into

| Abbreviation | Module title | ECTS credits | Method of grading | page |
|---|---|---|---|---|
| **Scientific Discipline (54 ECTS credits)** | | | | |
| **Cumpulsory Courses (54 ECTS credits)** | | | | |
| 10-M-ELZT-152-m01 | Elementary Number Theory | 6 | NUM | 16 |
| 10-M-ELGE-152-m01 | Elementary Geometry | 6 | NUM | 14 |
| 10-M-ELST-152-m01 | Elementary Stochastics | 5 | NUM | 15 |
| 10-M-GRLA-152-m01 | Basic Linear Analysis | 9 | NUM | 21 |
| 10-M-GRAN-152-m01 | Basic Analysis | 12 | NUM | 19 |
| 10-M-ANGE-152-m01 | Analytic Geometry | 6 | NUM | 5 |
| 10-M-GRDG-152-m01 | Basic Differential Equations | 5 | NUM | 20 |
| 10-M-M3GMR-152-m01 | Review Course Mathematics (German Grundschule/Mittelschule/Realschule) | 5 | B/NB | 23 |
| **Teaching (12 ECTS credits)** | | | | |
| **Compulsory Courses (12 ECTS credits)** | | | | |
| 10-M-DGGS1-152-m01 | Didactics of Mathematics - Geometry (German Grundschule) | 5 | NUM | 8 |
| 10-M-DGGS2-152-m01 | Didactics of Mathematics - Arithmetics and Application of Mathematics (German Grundschule) | 7 | NUM | 9 |
| **Paper (4 ECTS credits)**<br>Students studying for a teaching degree Grundschule must complete a practical training in didactics and teaching methodology (studienbegleitendes fachdidaktisches Praktikum) which refers to one of the subjects they selected as vertieft studiertes Fach (subject studied with a focus on the scientific discipline) pursuant to Section 34 Subsection 1 No. 4 LPO I (examination regulations for teaching-degree programmes). The obligatory accompanying tutorial is offered by the respective subject. The ECTS credits obtained are counted in the subject Erziehungswissenschaften pursuant to Section 10 Subsection 3 LASPO (general academic and examination regulations for teaching-degree programms). | | | | |
| 10-M-SFDPGS-152-m01 | Practical Training in Classroom Teaching including Theory (German Grundschule) | 4 | B/NB | 28 |
| **Freier Bereich (general as well as subject-specific electives)**<br>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.<br>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". | | | | |
| **Mathematics**<br>(Freier Bereich (general as well as subject-specific electives) -- subject specific) | | | | |
| 10-M-DAGS1-152-m01 | Selected Topics in Didactics of Mathematics 1 (German Grundschule) | 2 | B/NB | 6 |
| 10-M-DMGS1-152-m01 | Methodology of Teaching in Mathematics 1 (German Grundschule) | 3 | B/NB | 10 |
| 10-M-DAGS2-152-m01 | Selected Topics in Didactics of Mathematics 2 (German Grundschule) | 2 | B/NB | 7 |
| 10-M-DMGS2-152-m01 | Methodology of Teaching in Mathematics 2 (German Grundschule) | 3 | B/NB | 11 |
| 10-M-DVHB-152-m01 | E-Learning and Blended Learning in Mathematical Teaching (virtual Course) | 3 | B/NB | 12 |
| 10-M-VHBAri-152-m01 | Basics in Arithmetics (virtual course) | 2 | B/NB | 29 |
| 10-M-VHBGeo-152-m01 | Basics in School Geometry (virtual course) | 2 | B/NB | 38 |
| 10-M-VHBSto-152-m01 | Stochastics in Sekundarstufe I (virtual course) | 2 | B/NB | 47 |
| 10-M-VHBM10-152-m01 | Mathematics in grade 10 (virtual course) | 2 | B/NB | 41 |

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|---|---|---|---|---|
| 10-M-VHBAuG-152-m01 | Basics of Mathematics für German Grundschule 1: Arithmetics and Orders of Magnitude (virtual course) | 2 | B/NB | 31 |
| 10-M-VHBGuS-152-m01 | Basics of Mathematics für German Grundschule 2: Geometry and Stochastics (virtual course) | 2 | B/NB | 40 |
| 10-M-GBM-152-m01 | Basic Notions and Methods of Mathematical Reasoning | 2 | B/NB | 17 |
| 10-M-VHBDG-152-m01 | Didactics of Geometry (virtual course) | 2 | B/NB | 34 |
| 10-M-VHBDA-152-m01 | Didactics of Algebra (virtual course) | 2 | B/NB | 32 |
| 10-M-VHBEx-152-m01 | Exam Tutorial Didactics of Mathematics (virtual course) | 2 | B/NB | 36 |
| 10-M-VHBMa1-152-m01 | Mathematics 1 (virtual course) | 2 | B/NB | 43 |
| 10-M-VHBMa2-152-m01 | Mathematics 2 (virtual course) | 2 | B/NB | 45 |
| 10-M-MMMG1-152-m01 | Methods and Media in Teaching Mathematics 1 (German Grundschule) | 3 | B/NB | 24 |
| 10-M-MMMG2-152-m01 | Methods and Media in Teaching Mathematics 2 (German Grundschule) | 3 | B/NB | 25 |
| 10-M-SCH-152-m01 | School Mathematics from a Higher Perspective | 5 | B/NB | 26 |
| **Paper (10 ECTS credits)**<br>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. | | | | |
| 10-M-HMGS-152-m01 | Thesis in Mathematics (German Grundschule) | 10 | NUM | 22 |

| Module title | | | Abbreviation |
|---|---|---|---|
| **Analytic Geometry** | | | 10-M-ANGE-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)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Applications of linear algebra to analytic geometry: quadrics, characterisation of affine maps and isometries, discussion of Euclidean spaces (scalar products, arcs, orthonormal bases).

**Intended learning outcomes**

The students is acquainted with advanced methods, concepts and results in linear algebra and analytic geometry. He/She is able to comprehend the central proof methods, can perform easy mathematical arguments and present them orally and in written form. He/She can analyse basic mathematical problems and employ methods of linear algebra and analytic geometry to solve them.

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

V (4) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a 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**

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**Additional information**

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**Workload**

180 h

**Teaching cycle**

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

§ 51 I Nr. 2

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| 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 can be chosen to earn a 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**

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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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| 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 can be chosen to earn a 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**

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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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Didactics of Mathematics - Geometry (German Grundschule)** | | | 10-M-DGGS1-152-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**

In-depth discussion of topics in teaching geometry in Grundschule, taking didactic aspects into account (aims of geometry, spatial visualisation ability, planar figures, symmetries, 3-dimensional solids, geometric drawing). Possibilities of implementation in the classroom and employment of materials and media, including modern technologies.

**Intended learning outcomes**

The student knows about the objectives of teaching geometry in elementary school, basics in developmental psychology and didactics of mathematics, fundamentals in elementary school mathematics, as well as important models, presentations and media which can be employed in elementary school teaching of mathematics. She/he knows about common difficulties and problems of pupils in the acquisition of mathematical skills, and can employ and assess 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 can be chosen to earn a 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**

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**Additional information**

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**Workload**

150 h

**Teaching cycle**

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

§ 51 I Nr. 4

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
exchange program Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Didactics of Mathematics - Arithmetics and Application of Mathematics (German Grundschule)** | | | 10-M-DGGS2-152-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)** | |
| 7 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 2 semester | undergraduate | -- | |

**Contents**

In-depth discussion of topics in teaching arithmetics and application-oriented mathematics in Grundschule, taking didactic aspects into account (aims of teaching arithmetics, didactic principles, sets, numbers, positional notations, arithmetic models, elementary arithmetic, mental calculation, half-written and written calculations, aims of teaching applications of mathematics, treatment of quantities, representation of data, possibilities of teaching application-oriented mathematics, heuristic principles, strategies and tools, modelling, mappings, typical difficulties in solving text problems, possibilities of promoting competences in applied calculation). Possibilities of implementation in the classroom and employment of materials and media, including modern technologies.

**Intended learning outcomes**

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

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

V (2) + Ü (1) + V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) oral examination of one candidate each (approx. 30 minutes) or
b) oral examination in groups (groups of 2, approx. 15 minutes per candidate) or
c) written examination (approx. 60 to 120 minutes)

**Allocation of places**

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**Additional information**

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**Workload**

210 h

**Teaching cycle**

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

§ 51 I Nr. 4

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
exchange program Mathematics (2023)

| 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 can be chosen to earn a 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**

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**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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| 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 can be chosen to earn a 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**

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**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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| 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 can be chosen to earn a 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**

90 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Gymnasium Mathematics (2019)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Gymnasium Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Elementary Geometry** | | | 10-M-ELGE-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)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Fundamental topics in elementary and Euclidean geometry: axiomatic foundations of Euclidean geometry, congruence geometry, imaging geometry, similarity geometry, basics in analytic geometry in R^3, introduction to basic mathematical techniques.

**Intended learning outcomes**

The student knows the basic ways of thinking and working in mathematics, as well as the fundamental mathematical proof methods. He/She is able to apply these skills to basic problems in Euclidean geometry.

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

V (4) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a 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) and written exercises (approx. 12 exercise sheets, approx. 3 exercises per sheet).

**Allocation of places**

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**Additional information**

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**Workload**

180 h

**Teaching cycle**

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

§ 51 I Nr. 3

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Elementary Stochastics** | | | 10-M-ELST-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**

Fundamental topics in elementary stochastics: descriptive statistics, probability theory, combinatorics, inferential statistics, stochastic modelling, introduction to basic mathematical techniques.

**Intended learning outcomes**

The student knows the basic ways of thinking and working in mathematics, as well as the fundamental mathematical proof methods. He/She is able to apply these skills to basic problems in stochastics.

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

V (3) + Ü (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a 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) and written exercises (approx. 12 exercise sheets, approx. 3 exercises per sheet).

**Allocation of places**

--

**Additional information**

--

**Workload**

150 h

**Teaching cycle**

--

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

§ 51 I Nr. 3

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Elementary Number Theory** | | | 10-M-ELZT-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)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Introduction to fundamental techniques in mathematics. Approach to the number as a basic theme in mathematics, basic topics in elementary number theory and the structure of the number system.

**Intended learning outcomes**

The student knows the basic ways of thinking and working in mathematics, as well as the fundamental mathematical proof methods. He/She is able to apply these skills to basic problems in the fields of number theory and the structure of the number system.

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

V (4) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a 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) and written exercises (approx. 12 exercise sheets, approx. 3 exercises per sheet).

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

--

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

§ 51 I Nr. 3

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Basic Notions and Methods of Mathematical Reasoning** | | | 10-M-GBM-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**

Introduction to the basic notions and proof techniques in mathematics: approach to sets, formal logic and maps.

**Intended learning outcomes**

The student gets acquainted with the basic working techniques which are prerequisites for the further courses in the Bachelor's degree study programme.

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

V (1) + Ü (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

project (10 to 15 pages)
Language of assessment: German and/or English

**Allocation of places**

--

**Additional information**

Additional information on module duration: block taught prior to the beginning of the lecture period.

**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)

**Module appears in**

Bachelor's degree (1 major) Mathematics (2015)
Bachelor's degree (1 major) Economathematics (2015)
Bachelor's degree (1 major) Mathematical Physics (2015)
Bachelor's degree (1 major) Computational Mathematics (2015)
First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
Bachelor's degree (1 major) Mathematical Physics (2016)
Bachelor's degree (1 major) Economathematics (2017)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
Bachelor's degree (1 major) Mathematical Physics (2020)
Bachelor's degree (1 major) Economathematics (2021)
Bachelor's degree (1 major) Economathematics (2022)
Bachelor's degree (1 major) Mathematical Data Science (2022)
exchange program Mathematics (2023)

Bachelor's degree (1 major) Mathematics (2023)
Bachelor's degree (1 major) Economathematics (2023)
Bachelor's degree (1 major) Mathematical Physics (2024)
Bachelor's degree (1 major) Economathematics (2024)
Bachelor's degree (1 major) Economathematics (2025)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Basic Analysis** | | | 10-M-GRAN-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)** | |
| 12 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 2 semester | undergraduate | -- | |

**Contents**

Convergence and divergence of sequences and series, functions, continuity, differentiation and integration (Riemann integral), Taylor approximation and power series, functions in several variables, total and partial differentiability, inverse and implicit function theorem, curves in R^n, curve integrals, integration theorems in higher dimensions (Fubini's theorem, transformation rule), examples and applications.

**Intended learning outcomes**

The student is aquainted with methods and concepts in analysis of one and several variables. He/She is able to comprehend the central proof methods, can perform easy mathematical arguments and present them in written form. He/She can analyse basic mathematical problems and employ methods of analysis in one and several variables to solve them.

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

V (4) + Ü (2) + V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 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**

360 h

**Teaching cycle**

--

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

§ 51 I Nr. 1

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Basic Differential Equations** | | | 10-M-GRDG-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**

Examples and natural appearances of ordinary differential equations, existence and uniqueness theorems (Picard-Lindelöf, Peano), systems of linear differential equations, applications and examples.

**Intended learning outcomes**

The student is aquainted with methods and concepts of ordinary differential equations. He/She is able to comprehend the central proof methods, can perform easy mathematical arguments and present them in written form. He/She can analyse basic mathematical problems and employ methods of differential equations to solve them.

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

V (3) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a 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)

§ 51 I Nr. 1

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Basic Linear Analysis** | | | 10-M-GRLA-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)** | |
| 9 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Basics in linear algebra: groups, rings, fields, systems of linear equations, vector spaces, matrices and determinants, linear maps, examples and applications.

**Intended learning outcomes**

The student is aquainted with the basic methods and concepts of linear algebra. He/She is able to comprehend the central proof methods, can perform easy mathematical arguments and present them in written form. He/She can analyse basic mathematical problems and employ methods of linear algebra to solve them.

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

V (4) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a 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**

270 h

**Teaching cycle**

--

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

§ 51 I Nr. 2

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Thesis in Mathematics (German Grundschule)** | | | 10-M-HMGS-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)** | |
| 10 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| | 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 to module

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Hausarbeit (thesis) pursuant to Section 29 LPO I (examination regulations for teaching-degree programmes) (250 to 300 hours)

**Allocation of places**

--

**Additional information**

--

**Workload**

300 h

**Teaching cycle**

--

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

§ 29

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Review Course Mathematics (German Grundschule/Mittelschule/Realschule)** | | | 10-M-M3GMR-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** | |
| 1 semester | undergraduate | -- | |

**Contents**

Revision and consolidation of the topics in analysis, ordinary differential equations, linear algebra and analytic geometry by completing exercises and answering past state examination questions.

**Intended learning outcomes**

The student has advanced knowledge in the topics stated in LPO I (examination regulations for teaching degree programmes), §51 (2) 1, 2, and is able to apply them on the level of the state examination.

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

Ü (4)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) talk (approx. 45 minutes) or
b) project (10 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

150 h

**Teaching cycle**

--

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

§ 51 special branch of science without assignment

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))

| 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 can be chosen to earn a 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**

--

**Workload**

90 h

**Teaching cycle**

--

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

§ 22 II Nr. 1 h)

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| 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 can be chosen to earn a 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| Module title | | | Abbreviation |
|---|---|---|---|
| **School Mathematics from a Higher Perspective** | | | 10-M-SCH-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** | |
| 1 semester | undergraduate | -- | |

**Contents**

Discussion of selected topics in school mathematics with respect to their integration into wider theories and their didactic implementation at both school and university levels.

**Intended learning outcomes**

By means of selected examples, the student gains insight into the interrealtion between school mathematics and advanced mathematical theories. He/She is able to discuss these under mathematical, didactical and methodical aspect.

**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 can be chosen to earn a bonus)

a) talk (approx. 45 minutes) or
b) term paper (10 to 15 pages) or
c) project work (15 to 25 hours)
Language of assessment: German and/or English
Assessment offered: In the semester in which the course is offered and in the subsequent semester

**Allocation of places**

--

**Additional information**

--

**Workload**

150 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 appears in**

Bachelor's degree (1 major) Mathematics (2015)
Bachelor's degree (1 major) Mathematical Physics (2015)
Bachelor's degree (1 major) Computational Mathematics (2015)
First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
Bachelor's degree (1 major) Mathematical Physics (2016)
First state examination for the teaching degree Gymnasium Mathematics (2019)

First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
Bachelor's degree (1 major) Mathematical Physics (2020)
Bachelor's degree (1 major) Mathematical Data Science (2022)
exchange program Mathematics (2023)
First state examination for the teaching degree Gymnasium Mathematics (2023)
Bachelor's degree (1 major) Mathematics (2023)
Bachelor's degree (1 major) Mathematical Physics (2024)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Training in Classroom Teaching including Theory (German Grundschule)** | | | 10-M-SFDPGS-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)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

The module introduces the student to the classroom practice of his/her Unterrichtsfach (subject studied with a focus on the scientific discipline) or Didaktikfach (subject studied with a focus on teaching methodology). Using specific teaching models, examples and projects in different grades, the module introduces the student to subject-specific techniques. In the university course accompanying the placement, the student reflects and structures what he/she has learned during his/her teaching placement and explores additional subject-specific and didactic aspects. In this context, the course discusses selected practical aspects of teaching mathematics in accordance with applicable guidelines and curricula. The course focuses on recent developments in classroom practice, also taking into account aspects of school pedagogy and learning psychology that can support the successful practical implementation of subject-specific conceptual designs.

**Intended learning outcomes**

The student is acquainted with the most important components of planning and organising teaching. He/She is able to teach the relevant topics for different forms, and can critically reflect the recent developments in the educational system. He/She is able to connect ideas from school pedagogy and learning psychology with didactical cognisance and incorporate them in the mise-en-scène of his/her teaching.

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

P (0) + S (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) presentation (30 to 45 minutes) with position paper (1 to 2 pages) or
b) term paper (10 to 15 pages)
Contents and duration of placement as specified in Section 34 Subsection 1 Sentence 1 No. 4 LPO I (examination regulations for teaching-degree programmes); participation in mandatory teaching practice, completion of all set tasks as specified by placement school.

**Allocation of places**

--

**Additional information**

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**Workload**

120 h

**Teaching cycle**

--

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

§ 34 I 1 Nr. 4

**Module appears in**

First state examination for the teaching degree Grundschule Educational Science (2015)

| 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 can be chosen to earn a 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Gymnasium Mathematics (2019)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)
First state examination for the teaching degree Gymnasium Mathematics (2023)

| 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 can be chosen to earn a 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| 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 can be chosen to earn a bonus)

project (web-based, 15 to 20 hours)
Assessment offered: Once a year, 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), § 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)

First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| 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 can be chosen to earn a 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)

First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| 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 can be chosen to earn a 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))

| 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 can be chosen to earn a 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Gymnasium Mathematics (2019)

First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)
First state examination for the teaching degree Gymnasium Mathematics (2023)

| 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 can be chosen to earn a 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)

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)

| 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 can be chosen to earn a 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Gymnasium Mathematics (2019)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)
First state examination for the teaching degree Gymnasium Mathematics (2023)

| 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 can be chosen to earn a bonus)

project (web-based, 15 to 20 hours)
Assessment offered: Every two years, 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Gymnasium Mathematics (2019)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)
First state examination for the teaching degree Gymnasium Mathematics (2023)

| 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 can be chosen to earn a bonus)

project (web-based, 15 to 20 hours)
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)
§ 22 II Nr. 2 f)
§ 22 II Nr. 3 f)

**Module appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Gymnasium Mathematics (2019)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)
First state examination for the teaching degree Gymnasium Mathematics (2023)

| 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 can be chosen to earn a 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 appears in**

First state examination for the teaching degree Grundschule Mathematics (2015)
First state examination for the teaching degree Grundschule Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Realschule Mathematics (2015)
First state examination for the teaching degree Gymnasium Mathematics (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2015)
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Mittelschule Mathematics (2015)
First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2015)
First state examination for the teaching degree Gymnasium Mathematics (2019)
First state examination for the teaching degree Mittelschule Mathematics (2020 (Prüfungsordnungsversion 2015))

First state examination for the teaching degree Mittelschule Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Middle School) (2020 (Prüfungsordnungsversion 2015))
First state examination for the teaching degree Sonderpädagogik Didactics in Mathematics (Primary School) (2020 (Prüfungsordnungsversion 2015))
exchange program Mathematics (2023)
First state examination for the teaching degree Gymnasium Mathematics (2023)