## Module title

Advances in Mathematics (German Grundschule/Hauptschule/Realschule)

### Abbreviation

10-M-M2GHR-092-m01

## Module coordinator

Dean of Studies Mathematik (Mathematics)

## Module offered by

Institute of Mathematics

## ECTS

18

## Method of grading

numerical grade

## Only after succ. compl. of module(s)

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## Duration

3 semester

## Module level

undergraduate

## Other prerequisites

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## Contents

Advanced topics in the two most important fields of mathematics: applications of linear algebra in analytic geometry; extension of analysis from one to several variables, basics in ordinary differential equations and application of methods of analysis and linear algebra in this field.

## Intended learning outcomes

The students is acquainted with advanced methods, concepts and results in linear algebra and analytic geometry, as well as in analysis in several variables and the theory of ordinary differential equations. 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 analysis in one and several variables, linear algebra, analytic geometry and the theory of ordinary differential equations to solve them.

## Courses

This module has 4 components; information on courses listed separately for each component.

- **10-M-M2GHR-P-092**: M (no information on language and number of weekly contact hours available)
- **10-M-M2GHR-1-092, 10-M-M2GHR-2-092, and 10-M-M2GHR-3-092**: V + Ü (no information on language and number of weekly contact hours available)

## Method of assessment

This module has the following 4 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole.

### Assessment in module component 10-M-M2GHR-P-092: Aufbau Mathematik - Prüfung (Grund-, Haupt- und Realschule)

- 1 ECTS credit, numerical grading
- written examination (approx. 120 minutes); if announced by the lecturer, the written examination may be replaced by an oral examination of one candidate each (approx. 30 minutes) or an oral examination in groups (groups of 2: approx. 45 minutes, groups of 3: approx. 60 minutes) or by a written and/or multi-media portfolio (as announced).

Only after successful completion of module components: Module component 10-M-M2GHR-P can only be taken by students who successfully completed the three module components 10-M-M2GHR-1, 10-M-M2GHR-2 and 10-M-M2GHR-3.

### Assessment in module component 10-M-M2GHR-1-092: Aufbau Mathematik - Analysis in mehreren Variablen (Grund-, Haupt- und Realschule)

- 5 ECTS credits (10-M-M2GHR-2-092: 7 ECTS credits), pass / fail
- exercises: at the beginning of the course, the lecturer will specify the type and scope of exercises to be successfully completed over the course of the semester for the module component to be considered successfully completed.
### Allocation of places

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### Additional information

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

§ 51 (1) 1. Mathematik Differential- und Integralrechnung, Gewöhnliche Differentialgleichungen
§ 51 (1) 2. Mathematik Lineare Algebra und Analytische Geometrie

### Module appears in

- First state examination for the teaching degree Grundschule Mathematics (2009)
- First state examination for the teaching degree Hauptschule Mathematics (2009)
- First state examination for the teaching degree Realschule Mathematics (2009)
- First state examination for the teaching degree Mittelschule Mathematics (2013)