Module title			Abbreviation
Algebra, Geometry and Number Theory			10-M-AGZ-072-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)**	
22	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
3 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

Introduction to algebra, number theory and geometry: basic algebraic structures (groups, rings, fields); arithmetic properties of integers and rational numbers (as well as algebraic extensions) relating to their algebraic structures (residue class rings and finite fields) and their geometry (quadratic forms); axiomatic introduction of projective spaces, coordinates, fundamental theorems, relations to linear algebra and algebra, curves and hypersurfaces in Euclidean spaces, curvature.

Intended learning outcomes

The student is acquainted with the fundamental concepts and methods in algebra, geometry and number theory.He/She is able to relate these concepts with one another, and realises the advantages of thinking across the borders of different branches in mathematics.

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

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

- 10-M-AGZ-1-072: V + Ü (no information on language and number of weekly contact hours available)
- 10-M-AGZ-2-072: V + Ü + V + Ü (no information on language and number of weekly contact hours available)
- 10-M-AGZ-3-072: V + Ü (no information on language and number of weekly contact hours available)
- 10-M-AGZ-P-072: M (no information on language and number of weekly contact hours available)

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

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-AGZ-1-072: Einführung in die Algebra (Introduction to Algebra)

- 7 ECTS credits, pass / fail
- a) written examination (approx. 90 minutes, usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups of 2 candidates (approx. 30 minutes)
- Language of assessment: German; English if agreed upon with examiner(s)
- Additional prerequisites: Module 10-M-LNA recommended.

Assessment in module component 10-M-AGZ-2-072: Einführung in die Geometrie (Introduction to Geometry)

- 8 ECTS credits, pass / fail
- a) written examination (approx. 90 minutes, usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups of 2 candidates (approx. 30 minutes)
- Language of assessment: German; English if agreed upon with examiner(s)
- Additional prerequisites: Module 10-M-LNA recommended.

Assessment in module component 10-M-AGZ-3-072: Elementare Zahlentheorie (Elementary Number Theory)

- 5 ECTS credits, pass / fail
- a) written examination (approx. 90 minutes, usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups of 2 candidates (approx. 30 minutes)
- Language of assessment: German; English if agreed upon with examiner(s)
- Additional prerequisites: Module 10-M-LNA recommended.

Assessment in module component 10-M-AGZ-P-072: Prüfung Algebra, Geometrie und Zahlentheorie (Assessment Algebra, Geometry and Number Theory)

- 2 ECTS credits, numerical grading

- oral examination of one candidate each (approx. 30 minutes)
- Language of assessment: German; English if agreed upon with examiner(s)
- Only after successful completion of module components: Two out of the following three module components: 10-M-AGZ-1, 10-M-AGZ-2, 10-M-AGZ-3.
- Additional prerequisites: Module 10-M-LNA recommended.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor's degree (1 major) Mathematics (2007)