Module title | Overview Algebra and Numerical Mathematics 1 for Teaching Degree (German Gymnasium)
Abbreviation | 10-M-ANUL-Ü-191-m01

Module coordinator | Dean of Studies Mathematik (Mathematics)
Module offered by | Institute of Mathematics
ECTS | 10
Method of grading | numerical grade
Duration | 2 semester
Module level | --
Other prerequisites | --

Contents
- Topics in Group Theory (particularly finite abelian groups, normal subgroups, sub- and factorgroups, isomorphism theorems, solvability, group operations, Sylow theorems; examples: cyclic groups, alternating and symmetric groups, dihedral groups).
- Topics in ring theory (particularly ideals, divisibility, polynomial rings, irreducibility of polynomials).
- Topics in number theory (particularly Euclidean algorithm, Fermat’s little theorem, Euler’s theorem, Chinese remainder theorem, residue class rings and their unit groups, quadratic number rings).
- Topics in numerical mathematics: Solution of systems of linear equations and curve fitting problems, nonlinear equations and systems of equations, interpolation with polynomials, splines and trigonometric functions, numerical integration.

Intended learning outcomes
The student is acquainted with fundamental concepts and methods in algebra and numerical mathematics. 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
(V (4) + V (4) + Ü (2))

Method of assessment
oral examination of one candidate each (20 to 40 minutes)
Language of assessment: German and/or English
Assessment will have reference to the contents of modules 10-M-ALGL und 10-M-NUL1

Allocation of places
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Additional information
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Referred to in LPO I
§ 73 I Nr. 2 (5 LP), § 73 I Nr. 5 (5 LP)

Module appears in
First state examination for the teaching degree Gymnasium Mathematics (2019)