

<b>Module title</b>		<b>Abbreviation</b>
Overview Applied Algebra and Number Theory		10-M-AAZT-Ü-232-m01
<b>Module coordinator</b>		<b>Module offered by</b>
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
<b>ECTS</b>	<b>Method of grading</b>	<b>Only after succ. compl. of module(s)</b>
12	numerical grade	--
<b>Duration</b>	<b>Module level</b>	<b>Other prerequisites</b>
1 semester	undergraduate	--
<b>Contents</b>		
<p>Topics in field theory (particularly algebraic field extensions, ruler and compass constructions, basics in Galois theory, solvability of equations, cyclotomic fields, finite fields). Applications of algebra and number theory (e.g., coding theory, cryptography, computer algebra).</p> <p>Elementary properties of divisibility, prime numbers and prime number factorisation, modular arithmetics, prime tests and methods for factorisation, structure of the residue class rings, theory of quadratic remainder, quadratic forms, diophantine approximation and diophantine equations.</p>		
<b>Intended learning outcomes</b>		
<p>The student has extensive knowledge of the mathematical ways of thinking and working as well as of proof methods, so that he/she masters the basic notions of algebra and number theory and can apply them to elementary problems in other fields of mathematics.</p>		
<b>Courses</b> (type, number of weekly contact hours, language – if other than German)		
V (4) + Ü (2)		
<b>Method of assessment</b> (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)		
<p>oral examination of one candidate each (20 to 40 minutes)</p> <p>Assessment will have reference to two topics in pure mathematics as agreed upon with the examiner. Each topic may only be selected as the subject of one examination in the sub-fields Gesamtüberblick (Overview).</p> <p>Language of assessment: German and/or English</p>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
360 h		
<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Mathematics (2023)		