

Module title		Abbreviation
Fundamentals Pure Mathematics		10-M-REI-G-131-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)
8	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<p>One of the following topics in pure mathematics: Introduction to Algebra (Fundamental algebraic structures: groups, rings, fields; Galois theory) Introduction to Differential Geometry (Curves in Euclidean spaces, curvature, Frenet equations, local classification, submanifolds in Euclidean spaces, hypersurfaces in particular, curvature of hypersurfaces, geodesics, isometries, main theorem on local surface theory, special classes of surfaces) Ordinary Differential Equations (Existence and uniqueness theorem; continuous dependence of solutions on initial values, systems of linear differential equations, matrix exponential series, linear differential equations of higher order) Introduction to Complex Analysis (Complex differentiability and Cauchy-Riemann differential equations, path integrals and Cauchy integral theorems, isolated singularities, meromorphic functions and Laurent series, residue theorem and applications, Weierstraß product theorem and theorem of Mittag-Leffler, conformal maps) Geometric Analysis (Fundamentals in analysis on manifolds, submanifolds, calculus of differential forms, Stokes's theorem and applications in vector analysis and topology) Introduction to Projective Geometry (Projective and affine planes, projective and affine spaces, theorem of Desargues, fundamental theorems for projective spaces, dualities and polarities of projective spaces).</p>		
Intended learning outcomes		
The student knows and masters the essential methods and basic notions in one branch of pure mathematics. He/She is acquainted with the central concepts in this field, and is able to apply the fundamental proof methods independently.		
Courses (type, number of weekly contact hours, language – if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language 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)		
written examination (approx. 90 to 180 minutes); if announced by the lecturer at the beginning of the course, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English		
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' degree (1 major) Mathematics (2014)