

Module title					Abbreviation
Fundamentals Pure Mathematics					10-M-REI-G-131-m01
Module coordinator				Module offered by	
Dean of Studies Mathematik (Mathema			itics) Institute of Mathematics		
ECTS Method of grading		od of grading	Only after succ. compl. of module(s)		
8 (not) successfully completed					
Duration		Module level	Other prerequisites		
1 semester		undergraduate			
Contents					
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 classifica- tion, submanifolds in Euclidean spaces, hypersurfaces in particular, curvature of hypersurfaces, geodesics, iso- metries, main theorem on local surface theory, special classes of surfaces)					
Ordinary Differential Equations (Existence and uniqueness theorem; continuous dependence of solutions on in-					
higher order) Introduction to Complex Analysis (Complex differentiability and Cauchy-Riemann differential equations, path in- tegrals 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, Sto- ke's theorem and applications in vector analysis and topology) Introduction to Projective Geometry (Projective and affine planes, projective and affine spaces, theorem of De- sargues, fundamental theorems for projective spaces, dualities and polarities of projective spaces).					
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					
Additional information					
Workload					
Teachir	ng cycl	e			
Referred to in LPO I (examination regulations for teaching-degree programmes)					
Module appears in					

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Bachelor's degree (1 major) Mathematics (2014)

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