Module title			Abbreviation
Geometric Analysis and Partial Differential Equations			10-M-GAP-092-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)**	
13	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

Basics in analysis on manifolds, e. g. submanifolds and calculus of differential forms, Stoke's theorem and its applications in vector calculus and topology, examples of first order partial differential equations, existence and uniqueness theorems, basic equations in mathematical physics, boundary value theorems, maximum principle and Dirichlet problem.

Intended learning outcomes

The student knows and masters the basic notions and essential methods of vector analysis on manifolds and partial differential equations. He/She is able to perform mathematical arguments in this field independently, and can present them adequately in written and oral form. He/She is able to apply the central proof methods and concepts of geometric analysis and partial differential equations and knows about their analytic background.

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

This module comprises 3 module components. Information on courses will be listed separately for each module component.

- 10-M-GAP-1-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-GAP-2-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-GAP-P-092: M (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)

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

Assessment in module component 10-M-GAP-1-092: Geometric Analysis Geometric Analysis

- 7 ECTS, Method of grading: (not) successfully completed
- 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 (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Modules 10-M-ANA and 10-M-LNA are recommended.

Assessment in module component 10-M-GAP-2-092: Partial Differential Equations Partial Differential Equations

- 4 ECTS, Method of grading: (not) successfully completed
- 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 (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Modules 10-M-ANA and 10-M-LNA are recommended.

Assessment in module component 10-M-GAP-P-092: Examination in Geometric Analysis and Partial Differential Equations

- 2 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: 10-M-GAP-1 or 10-M-GAP-2
- Other prerequisites: Modules 10-M-ANA and 10-M-LNA are recommended.

Allocation of places
--
Additional information
--
Workload
--
Teaching cycle
--
Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Module appears in
Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009)