Module title			Abbreviation
Ordinary Differential Equations			10-M-DGL-202-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)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Notion of a solution, simple solution methods for scalar differential equations (separation of variables, variation of constants, exact equations) and particular examples like Bernoulli, Riccati; initial value problem; existence and uniqueness of solutions; Gronwall lemma; extendability of solutions, maximal solution; continuous dependence of solutions on initial values, linear differential equations, algebraic structure of solution spaces, solution methods, matrix exponential function; autonomous systems; notion of stability; stability of linear systems; linearised asymptotic stability; Lypunov methods, first integrals.

Intended learning outcomes

The student is acquainted with the fundamental concepts and methods of the theory of ordinary differential equations. He/she is able to apply these methods to practical problems.

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

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Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 90 to 180 minutes, usually chosen) or
b) oral examination of one candidate each (15 to 30 minutes) or
c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate)
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

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's degree (1 major) Mathematical Physics (2020)
Bachelor's degree (1 major) Mathematical Physics (2024)
Bachelor's degree (1 major) Mathematical Physics (2026)