Valid from 2026.HS

Module description: Analysis 2

Module Code	t.BA.XXM5.AN2.26HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IAMP
Module Coordinator	Marcello Robbiani
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
Module Characteristic	Type 3a 2 lecture lessons per semester week and class+ 2 weekly lab lessons per semester and half-class
Module Description	Advanced calculus
Module Content	**Elementary functions** • power and root functions, exponential and logarithmic functions • trigonometric and hyperbolic functions and their inverses • elementary theory of oscillations **Differential calculus in one real variable** • derivation rules and methods • applications of differential calculus - extremal problems • power series, Taylor polynomials and series **Introduction to differential equations** **Integral calculus in one real variable** • definite and indefinite integral • fundamental theorem of calculus • rules and methods of integration, improper integrals • applications of integral calculus in geometry, science and technology
Prerequisite Knowledge	module Analysis I

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Learning Objectives (Competencies)

Students...	Competencies	Taxonomies
You know the consept of the approximation of functions by Taylor polynomials and are able to estimate the approximation error. You are able to develop analytical functions in Taylor series	F, M	K2, K3
You know the concept of a differential equation and the corresponding vocabulary. You know the concept of the solution to a differential equation.	F, M	K2, K3
You know the basical elements of functional thougth and are able to translate it in applications on exponential and logarithmical functions on hyperbolic functions and on area functions, on trigonometric functions and on arcus functions. In particular you know the role of the trigonometric additions theorems for the analysis of oscillations.	F, M	K2, K3
You know the fundamental concepts of differential and integral calculus. In particular you know the central role of the fundamental theorem of calculus.You are able to calculate derivatives and to apply them among others to the solution of extremal problems.You are able to use integration methods to calculate definite and indefinite integrals. You are able to apply integrals in geometry, science and technology.	F, M	K2, K3

Performance Assessment

End-of-module exam	Assessment	Length (min.)	Weighting	Social Form	Scenario/Format
written exam		90	80%	acc. to module agreement	

	Assessment	Length (min.)	Weighting	Social Form	Scenario/Format
at least one assessment	Grade		20%	acc. to module agreement	

Classroom Attendance Requirement

None

Learning material

- Papula, L. (2018). Mathematik für Ingenieure und Naturwissenschaftler. 15 Edition. Wiesbaden: Springer. ISBN 978-3-658-21745-7.