Module title: Applied Analysis
Abbreviation: 10-M=AAAN-102-m01

Module coordinator: Dean of Studies Mathematik (Mathematics)
Module offered by: Institute of Mathematics

ECTS: 10
Method of grading: numerical grade
Only after succ. compl. of module(s): --

Duration: 1 semester
Module level: graduate
Other prerequisites: Registration for the exercise must be made via SB@home at the begin-
ing of the course or as announced by the lecturer in accordance with
the specified registration deadlines. Certain prerequisites must be met
to qualify for admission to assessment (e. g. successful completion of a
certain percentage of exercises). The lecturer will inform students about
the respective details at the beginning of the course. Registration for the
exercise will be considered a declaration of will to seek admission to as-
sessment. If students have obtained the qualification for admission to
assessment over the course of the semester, the lecturer will put their re-
gistration for assessment into effect. Students who meet all prerequisites
will be admitted to assessment in the current or in the subsequent seme-
ter. For assessment at a later date, students will have to obtain the qua-
derification for admission to assessment anew.

Contents
In-depth study of functional analysis and operator theory, Sobolev spaces and partial differential equations,
time of Hilbert spaces and Fourier analysis, spectral theory and quantum mechanics, numerical methods (in
particular FEM methods), principles of functional analysis, function spaces, embedding theorems, compactness,
time of elliptic, parabolic and hyperbolic partial differential equations with methods from functional analysis.

Intended learning outcomes
The student is acquainted with the fundamental notions, methods and results of higher analysis. He/She is able
to establish a connection between his/her acquired skills and other branches of mathematics and questions in
physics and other natural and engineering sciences.

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)
At the beginning of the course, the lecturer will choose one of the following methods of assessment: a) written
examination (90 to 120 minutes), b) oral examination of one candidate each (approx. 20 minutes), c) oral exami-
nation in groups (groups of 2, approx. 30 minutes)
Assessment offered: Assessment offered in the semester in which the course is offered and in the subsequent
semester, course offered on demand or every four semesters.
Language of assessment: German, English

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Master’s degree (1 major) Mathematics (2012)
Master’s degree (1 major) Mathematics (2010)
Master's degree (1 major) Physics (2010)
Master's degree (1 major) Physics (2011)
Master's degree (1 major) Nanostructure Technology (2011)
Master's degree (1 major) Nanostructure Technology (2010)
Master's degree (1 major) Economathematics (2011)
Master's degree (1 major) Mathematical Physics (2012)
Master's degree (1 major) Computational Mathematics (2012)