Technology
Arts Sciences
TH Köln

Course Manual AM

Applied Mathematics

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General information

Long name	Applied Mathematics
Approving CModule	AM_BaET
Responsible	Prof. Dr. Beate Rhein Professor Fakultät IME
Valid from	winter semester 2021/22
Level	Bachelor
Semester in the year	winter semester
Duration	Semester
Hours in self-study	96
ECTS	5
Professors	Prof. Dr. Beate Rhein Professor Fakultät IME
Requirements	Apply basic mathematical knowledge, especially functions and differential calculus Be able to apply methods of linear algebra Apply basic concepts of programming
Language	German
Separate final exam	Yes

Literature

Knorrenschild: Numerische Mathematik (Fachbuchverlag)

Papula: Mathematik für Ingenieure und Naturwissenschaftler, Band 1+2 (Vieweg)

Final exam

Details	The theoretical basics and the associated calculation methods are tested in a written exam. The programming skills required to implement an algorithm are tested in a programming test.
Minimum standard	Both parts of the examination must be passed with at least 4.0. The written exam and the programming test are included proportionally in the module grade. The weighting is currently 70% for the written exam and 30% for the programming test.
Exam Type	EN andere summarische Prüfungsform

− Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	Computer arithmetic Error calculation, condition of a matrix Gaussian algorithm with column pivoting Interpolation Root finding algorithms (bisection, Newton, variants of Newton, fixed point iteration) Iteration methods for systems of linear equations Regression analysis Probability theory
Skills	be able to estimate the propagation of measurement errors be able to apply and code numerical algorithms be able to set up trend functions be able to handle probabilities

Special requirements

none

Accompanying material	Lecture slides online Exercises online Teaching videos online Instructions for programming online
Separate exam	No

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	1
Exercises (shared course)	0
Tutorial (voluntary)	0