Module title			Abbreviation
Numerical Mathematics			10-M-NUM-122-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)**	
20	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

Solution of systems of linear equations and curve fitting problems, nonlinear equations and systems of equations, interpolation with polynomials, splines and trigonometric functions, numerical integration, eigenvalue problems, linear programming, methods for initial value problems for ordinary differential equations, boundary value problems.

Intended learning outcomes

The student is acquainted with the fundamental concepts and methods in numerical mathematics, applies them to practical problems and knows about their advantages and limitations concerning their possibilities for application in natural and engineering sciences and economics.

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-NUM-1-122: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-NUM-2-122: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 10-M-NUM-P-122: 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-NUM-1-122: Numerical Mathematics 1 Numerical Mathematics 1

- 8 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 to 180 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes). Module will also be considered successfully completed if the module component was selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination was passed.
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-NUM-2-122: Numerical Mathematics 2 Numerical Mathematics 2

- 8 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 to 180 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes). Module will also be considered successfully completed if the

module component was selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination was passed.
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-NUM-P-122: Examination in Numerical Mathematics
- 4 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes); assessment will have reference to the contents of modules 10-M-NUM-1 and 10-M-NUM-2
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: Successful completion of the written examination in any one of the other two module components is a prerequisite for participation in module component 10-M-NUM-P.

Allocation of places

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Additional information

Additional information will be listed separately for each module component.
- 10-M-NUM-P-122: --
- 10-M-NUM-1-122: Additional information on module duration: 1 to 2 semesters.
- 10-M-NUM-2-122: Additional information on module duration: 1 to 2 semesters.

Workload

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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) Computational Mathematics (2012)
Bachelor's degree (1 major) Computational Mathematics (2013)