Module Name
Selected Topics of Numerical Mathematics and Scientific Computing

Type of Module	**Module Code**
Advanced Module	AM-STNM

Identification Number	**Workload**	**Credit Points**	**Term**	**Offered Every**	**Start**	**Duration**
MN-CS-STNM	270 Hours	9 CP	1. – 3. Semester	year	both	1 Semester

1	**Course Types**	**Contact Time**	**Private Study**	**Planned Group Size**
	a) Lecture	56 h	112 h	b) 30 Students
	b) Exercise	28 h	56 h	
	Exam Preparation		18 h	

2 Module Objectives and Skills to be Acquired

Knowledge of modern concepts and methods in selected areas of numerical mathematics and scientific computing, which are required to understand and solve problems in the field of applied mathematics, business mathematics and scientific computing. The students have acquired a deeper understanding of the fundamental issues of numerical mathematics and scientific computing in the areas covered.

In addition to in-depth specialist knowledge, additional skills for recognizing, formulating, classifying and solving problems are conveyed in lectures and exercises. Conceptual, analytical and logical thinking is trained. In addition to deepening the lecture material, the exercises also serve to acquire communication and presentation skills.

3 Module Content

Selected topics of numerical mathematics and scientific computing consists of the lectures offered by the lecturers of the area “Numerical Mathematics and Scientific Computging”. Special Lectures are announced in the internet and by the respective lecturers.

Possible topics are:

Numerics of Partial Differential Equations
Modeling and numerics of problems in fluid dynamics;
Modeling and numerical solution of continuum mechanics problems;
Modeling and numerical solution of medical and bio-mechanical problems;
Numerical financial mathematics;
Hyperbolic conservation equations;
Parallel Scientific Computing/High Performance Computing;
Numerics of Stochastic Differential Equations;

Literature: original work

4 Teaching Methods

Lecture with Blackboard and Beamer-Presentations, written and computer based exercises

5 Prerequisites (for the Module)

Formally: None

Regarding the contents: Knowledge in algorithmic mathematics, numerical mathematics and numerics of partial differential equations; further prerequisities after announcement possible

6 Type of Examination

Written Exam

7	**Credits Awarded** The module is passed and credit points are awarded if the 180-minute final exam is passed or the 30-45-minute oral final exam is passed. The prerequisite for admission to the exam is regular successful completion of the exercises. The respective lecturer announces the exact requirements at the beginning of the event. Registration is required to take the final exam; A resit examination is offered at the beginning of the following semester. Repeated participation in the lecture and the exercises to prepare for a repetition of the final examination is possible. The module is graded.
8	**Compatibility with other Curricula** None
9	**Proportion of Final Grade** 9/114
10	**Module Coordinator** G. Gassner, A. Klawonn, A. Kunoth
11	**Further Information**