

Module title		Module code
Mathematics 1		
Person responsible for the module	Faculty	
Prof. Dr. Rainer Löschel	Computer Science and mathematics	

Semester taught according to the curriculum	Level of study	Module type	Credit value
1.	1.		7

Mandatory requirements
none
Recommended previous knowledge
Pre- and bridge courses

Content
see next page

Assigned submodules

Nr.	Submodule title	Teaching hours	Credit value
1.	Mathematics 1 (Linear Algebra)	6 SWS	7

Submodule		Submodule abbreviation	
Mathematics 1 (Linear Algebra) (Mathematics 1)		MA 1	
Responsible person		Faculty	
Prof. Dr. Rainer Löschel		Computer Science and mathematics	
Lecturer		Availability of module	
Prof. Dr. Rainer Löschel			
Teaching method			
Seminar teaching (4 SWS) with integrated exercises (2 SWS)			

Semester taught according to the curriculum	Teaching hours	Teaching language	Credit value
1.	6 SWS		7

#### Study hours required

Hours in attendance/lectures	Hours for self-study
90h	120h

Method of assessment
written exam 90 min

Content
<ul style="list-style-type: none"> <li>- Fundamentals of logic: set theory, propositional logic and methods of proof.</li> <li>- Algebraic structures: relations, groups, rings, fields</li> <li>- Systems of linear equations: homogeneous, inhomogeneous; Gaussian elimination</li> <li>- Vectors and matrices: linear combinations, linear independence</li> <li>- Vector spaces: subspaces, basis and dimension, norm and scalar product</li> <li>- Linear maps: Image, kernel, composition; orthogonal maps</li> <li>- Quadratic matrices: inverse matrix, determinant, principal axis theorem</li> </ul>
Learning objectives: Subject competence
<p>After successful completion of the submodule, students are able to,</p> <ul style="list-style-type: none"> <li>- understand the concepts of linear algebra (3),</li> <li>- recognise the connections with other fields (e.g. analysis, numerical mathematics, technology and economics) (1),</li> <li>- be able to apply methods of linear algebra (3).</li> </ul>
Learning objectives: Personal competence
<p>After successful completion of the submodule, students are able to,</p> <ul style="list-style-type: none"> <li>- communicate professionally (2),</li> <li>- work on problems analytically and independently (2).</li> </ul>