

Module title		Module code
Databases		
Person responsible for the module	Faculty	
Prof. Dr. Johannes Schildgen	Computer Science and Mathematics	

Semester taught according to the curriculum	Level of study	Module type	Credit value
3./4.	2.	mandatory	7

Mandatory requirements
At least 30 credits from the 1st study stage
Recommended previous knowledge
Good programming skills in C, Java or C++ Theoretical computer science

Content
see next page

#### Assigned submodules

Nr.	Submodule title	Teaching hours	Credit value
1.	Databases	6 SWS	7

Submodule		Submodule abbreviation	
Databases		DAB	
Responsible person		Faculty	
Prof. Dr. Johannes Schildgen		Computer Science and Mathematics	
Lecturer		Availability of module	
Prof. Dr. Johannes Schildgen		only in winter semester	
Teaching method			
Seminar teaching (4 SWS) with exercises (2 SWS)			

Semester taught according to the curriculum	Teaching hours	Teaching language	Credit value
3.	6 SWS	english	7

#### Study hours required

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

Method of assessment
Written exam: 90 minutes

Content
<p>Conceptual data modelling: entity-relationship model.</p> <ul style="list-style-type: none"> <li>• Relational model: Relational algebra and normal forms.</li> <li>• SQL: database query language, data definition language (DDL, DML), views, rights management.</li> <li>• Database programming: transactions, accessing databases with suitable programming languages, user-defined functions, triggers.</li> <li>• Concurrency and database recovery: logging and recovery, concurrency, locking mechanisms, deadlocks.</li> <li>• Database optimisation: query optimisation, indexes.</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>• explain the functional principles of databases (1),</li> <li>• design small to medium-sized databases conceptually and logically (2),</li> <li>• set up (2) and use databases with the query language SQL. (2),</li> <li>• evaluate concepts such as views, triggers and user-defined functions (3) and select adequate concepts for specific use cases (3).</li> </ul>

<b>Learning objectives: Personal competence</b>
After successful completion of the submodule, students are able to, <ul style="list-style-type: none"><li>• model in cooperation with other databases -&gt; plan databases in a team (3)</li></ul>
<b>Teaching media</b>
Blackboard, projector, notebook
<b>Literature</b>
<ul style="list-style-type: none"><li>• C.J. Date: Introduction to Database Systems, Addison Wesley, 2003</li></ul>

The numbers in brackets indicate the levels to be reached: 1 - understanding 2 - ability 3 - understand and application