

# Introduction

**Prof. Alfons Kemper**

**Chair for Database Systems (I3)**

**[www.db.in.tum.de](http://www.db.in.tum.de)**

**TU München / Garching**

**[\[kemper\]@in.tum.de](mailto:[kemper]@in.tum.de)**

**Alice Rey (Exercises)**

# Lecture

- IN4714:
  - Part of the module **Geodatabases** (BV470015)
  - Duration: 2V SWS
  - Credits: 2 ECTS

# Study Programs, Modules and Courses

Study Program	Module	Courses	Exam
GuG	Spatial Databases and Visualization (BV300022), 6 ECTS	<ol style="list-style-type: none"> <li>1. Database System Concepts for Non-Computer Scientists</li> <li>2. Spatial Databases</li> <li>3. Visualisation of Geodata</li> </ol>	written test, 120 minutes
<ul style="list-style-type: none"> <li>• EE</li> <li>• UPIÖ (Kernbereich GIS),</li> <li>• ...</li> </ul>	Geodatabases (BV470015), 3 ECTS	<ol style="list-style-type: none"> <li>1. Database System Concepts for Non-Computer Scientists</li> <li>2. Spatial Databases</li> </ol>	written test, 60 minutes
<ul style="list-style-type: none"> <li>• UPIÖ (Kernbereich Landschaftsmanagement)</li> </ul>	Applied Geoinformatics (BV470019T2), 6 ECTS	<ol style="list-style-type: none"> <li>1. Database System Concepts for Non-Computer Scientists</li> <li>2. Spatial Databases</li> <li>3. Applied Geoinformatics 2</li> </ol>	<ul style="list-style-type: none"> <li>• Partial Exam Database Systems and Spatial Databases (50%): written test, 60 minutes</li> <li>• Partial Exam Applied Geoinformatics 2, Presentation + Report (50%)</li> </ul>

# Schedule

- Web page of the lecture:  
[db.in.tum.de/teaching/ws2022/DBSandere](https://db.in.tum.de/teaching/ws2022/DBSandere)
- **For dates always check TUM-Online**
- 2 hours weekly
- Wednesdays, 4.45 – 6.15 p.m.
- Exam details TBA

# Teaching

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- Questions during class are always welcome
  - Exercise material for preparation
- Interactive class !?

# Exercise Sheets

- Handed out (online) after each lecture
- Solutions are discussed in the following week
- Very good way to prepare for the exam

# Content Overview

- Introduction
- Database Design
  - E/R-Modeling
  - UML-Modeling
- Relational Data Model
- Relational Query Language: SQL
- Data Integrity

# Content Overview (cont.)

- Physical Data Organization
  - B-Trees
  - Hashing
- Query Execution
- Transaction Management

→ Preparation for Geodatabases,  
Dr. Andreas Donaubauer, starting in January



# Literature (in German)

Alfons Kemper und André Eickler  
Datenbanksysteme: Eine Einführung  
10. Auflage (2015)  
(older editions are also ok)  
Oldenbourg Verlag, München  
(~ 50 Euros)

[www-db.in.tum.de/teaching/bookDBMSeinf](http://www-db.in.tum.de/teaching/bookDBMSeinf)

# Additional Material

[tools.db.in.tum.de](http://tools.db.in.tum.de)

- Many useful database tools

<http://hyper-db.com/interface.html>

- A SQL webinterface based on HyPer

# Literature (in English)

A. Silberschatz, H. F. Korth und S. Sudarshan  
Database System Concepts, 6th edition,  
McGraw-Hill, 2010.  
[codex.cs.yale.edu/avi/db-book/db6/slide-dir/](http://codex.cs.yale.edu/avi/db-book/db6/slide-dir/)

R. Elmasri, S.B. Navathe  
Fundamentals of Database Systems, 6th edition,  
Addison-Wesley, 2010. (also available in  
German)

R. Ramakrishnan, J. Gehrke  
Database Management Systems, 3th edition,  
2003.  
<http://pages.cs.wisc.edu/~dbbook/>

## Literature (cont.), MOOCS

J.D. Ullmann, J. Widom

A First Course in Database Systems, Prentice Hall, 3rd edition, 2007.

[infolab.stanford.edu/~ullman/fcdb.html](http://infolab.stanford.edu/~ullman/fcdb.html)

## MOOCS

- Self paced mini courses, Stanford  
[class.stanford.edu/courses/DB/2014/SelfPaced/about](http://class.stanford.edu/courses/DB/2014/SelfPaced/about)
- Datenmanagement mit SQL, HPI  
[open.hpi.de/courses/sql](http://open.hpi.de/courses/sql) (in German)

## MOOCS (cont.), Lectures online

- Informationssysteme/  
Einführung in Datenbanksysteme, Uni Saarland  
[infosys.uni-saarland.de/datenbankenlernen/](http://infosys.uni-saarland.de/datenbankenlernen/)  
(partly in German)
- Lecture online (german)  
ETHZ, D. Kossmann, spring 2014:  
<http://www.video.ethz.ch/lectures/d-infk.html>  
English slides