

## Databases, LIX022B05 2013–2014 Semester Ia

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### Course Description:

This is a “first course in database management systems.” In this course, students are introduced to the theory and practice of working with relational databases. Students will learn common practices and pitfalls of database design, and learn to use SQL for both data manipulation and queries.

The course introduces logical database design (using ER diagrams), normalization, use of SQL for manipulating and querying data, and practical use of a relational database management system (using MySQL). The course will follow a practical perspective. However, the students will also be familiarized with the theoretical background of database management systems.

**Course Objectives:** After completing this course, students will

- be able to develop a conceptual data model that reflects an organization’s database requirements
- be able to convert the conceptual data model into a relational database schema
- be able to apply normalization techniques
- be able to identify data integrity and security requirements
- be able to construct complex SQL queries
- be familiar with fundamentals of database administration, performance and optimization
- gain hands-on experience with a database management system (MySQL)

**Prerequisites:** No formal requirements, but a good level of ‘computer literacy’ is assumed.

**Credits:** 5 ECTS

**Textbook:** *Database System Concepts* by A. Silberschatz, H. F. Korth and S. Sudarshan. McGraw-Hill (2010), ISBN 978-007-128959-7 (6th international ed.)

### Weekly Plan:

Week	Lecture	Reading
1	Introduction	Chapters 1 & 2
2	Logical DB Design (E-R diagrams)	Chapter 7
3	Relational DB Design, normalization	Chapter 8
4	SQL (1): basics	Chapter 3
5	SQL (2): complex queries	Chapter 4
6	SQL (3): views, indexes, access control	Sections from chapters 11, 12 & 13
7	SQL and programming & summary	Chapter 14, sections from Chapter 5

**Expected workload:**

This is a 5 ECTS course (140 hours of work). Here is an approximate breakdown of the course work:

Courses and practicum sessions	$4 \times 7 =$	28 hours
Reading before the courses	$5 \times 7 =$	35 hours
Exam & exam preparation		17 hours
Homeworks		60 hours
Total		140 hours

**Assessment:** Homework/lab assignments: 30%, Final exam: 70%.

To pass the course, a weighted average of the homeworks and the exam should be 5.5 or above.

**Homework/lab assignments:**

Homeworks will include both paper-and-pencil type of questions and practical exercises with MySQL and related tools. You are encouraged to work on the assignments during the lab sessions where you can get help when needed.

The average of the best five homework results will constitute the 30% of the final grade. The homeworks are to be submitted in English, as a single pdf file. Homework/lab reports are due one week after the lab session. Late reports (no more than one week) receive half credit.

**Courses:** Monday 11:00-13:00, 1315.0031

**Labs:** Friday 11:00-13:00, 1312.0107A

**Office Hours:** Wednesday 15.00–17.00 (or by appointment)

**Course Web Page:** <http://www.let.rug.nl/coltekin/courses/db/>

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