



## Database Management Systems

### Databasteknik

7.5 credits

7.5 högskolepoäng

---

**Ladok Code:** C1DB1A

**Version:** 2.0

**Established by:** Committee for Education in Librarianship, Information, and IT 2023-06-07

**Valid from:** Spring 2024

**Education Cycle:** First cycle

**Main Field of Study (Progressive Specialisation):** Informatics (G1N)

**Disciplinary Domain:** Natural sciences

**Prerequisites:** General entry requirements for university studies.

General entry requirements

**Subject Area:** Informatics/Computer and Systems Sciences

**Grading Scale:** Seven-degree grading scale (A-F)

---

### Content

The course covers database theory and concepts for the designing of databases as well as accessing and modifying their contents. A standardised programming language, Structured Query Language (SQL), is used to retrieve and modify data in relational databases. The course also covers aspects of database administration.

The components included in the course are:

- Database theory: basic concepts, data models, the relational model.
- SQL: syntax, queries, updates, structuring.
- Database design: modelling, normalization.
- Database administration: physical database design, indexing, denormalization, transaction management, security, legal and ethical aspects.

### Learning Outcomes

After completing the course, the student will be able to:

Knowledge and understanding

- 1.1. explain basic terminology and theory of relational databases
- 1.2. explain the different steps in the process of designing a database,
- 1.3. describe, justify and apply accepted principles for good database design,
- 1.4. describe the function of the database in an IT system and interface with other parts of the system,
- 1.5. describe the roles that exist in the development and operation of a database system, as well as explain denormalization and indexing in order to achieve good performance in a database,

Competence and skills

- 2.1. master the use of Unified Modelling Language (UML) for database design,
- 2.2. based on a verbal description, construct a conceptual data model,
- 2.3. based on a conceptual data model, construct a logical data model and relational data model,
- 2.4. incrementally normalize a relational data model to Boyce-Codd Normal Form (BCNF),
- 2.5. use well-structured SQL code to perform lookups, inserts and modifications of data in a relational database,
- 2.6. use SQL code to change tables and relationships between tables in a relational database.

Judgement and approach

- 3.1. explain and reflect on legal, ethical and security aspects relating to the introduction, operation and use of database systems.

### Forms of Teaching

The course consists of:

- lectures
- supervision in workshop form

- supervision of laboratory sessions.
- The teaching is conducted in English.

The language of instruction is English.

### **Forms of Examination**

The course will be examined through the following examination elements:

#### *Examination*

Learning outcomes:

Credits: 5

Grading scale: Seven-degree grading scale (A-F)

#### *Laboration: application of SQL (group assignment)*

Learning outcomes:

Credits: 1

Grading scale: Fail (U) or Pass (G)

#### *Laboration: design, data access and documentation of database (group assignment)*

Learning outcomes:

Credits: 1.5

Grading scale: Fail (U) or Pass (G)

The course is examined through the following examination components:

#### Examination

Learning outcomes: 1.1-1.6, 2.1-2.6, 3.1

Credits: 5.0

Grading scale: Seven-point grading scale (A-F)

Laboratory session: application of SQL (group assignment)

Learning outcomes: 2.5-2.6

Credits: 1.0

Grading scale: Pass or Fail

Laboratory session: design, data access, and documentation of databases (group assignment)

Learning outcomes: 2.1-2.4

Credits: 1.5

Grading scale: Pass or Fail

For the grade E on the whole course, a minimum of the grade E is required on the Examination and a passing grade on the other examination components is required. A higher grade for the entire course is then determined by the grade on the Examination.

If the syllabus is changed, students who wish to complete tasks from a course session will be examined based on the course's new content and structure. When the course has ended, students who wish to complete tasks can follow all or parts of another equivalent course.

If the student has a decision/recommendation regarding special pedagogical support from the University of Borås due to disability, the examiner has the right to adapt examinations. The examiner has to decide based on the syllabus's objectives whether the examinations can be adapted in accordance with the decision/recommendation.

The student's rights and obligations regarding examination are in accordance with guidelines and regulations in place at the University of Borås.

If the student has received a decision/recommendation regarding special pedagogical support from the University of Borås due to disability or special needs, the examiner has the right to make accommodations when it comes to examination. The examiner must, based on the objectives of the course syllabus, determine whether the examination can be adapted in accordance with the decision/recommendation.

Student rights and obligations at examination are in accordance with guidelines and rules for the University of Borås.

### **Literature and Other Teaching Methods**

The course literature is in English.

Connolly, T.M., & Begg, C.E. (2014 or later). Database systems: a practical approach to design, implementation, and management (6th ed. or later). Harlow: Pearson

Scientific articles of approx. 100 pages can be added according to the teacher's instructions.

**Student Influence and Evaluation**

The course is evaluated in accordance with current guidelines for course evaluations at the University of Borås in which students' views are to be gathered. The course evaluation report is published and returned to participating and prospective students in accordance with the above-mentioned guidelines, and will be taken into consideration in the future development of courses and education programmes. Course coordinators are responsible for ensuring that the evaluations are conducted as described above.

**Miscellaneous**

This syllabus is a translation from the Swedish original.