Database Technology

Programme course

6 credits

Databasteknik

TDDD37

Valid from: 2017 Spring semester

Determined by
Board of Studies for Computer Science
and Media Technology

Date determined
2017-01-25

Main field of study
Information Technology, Computer Science and Engineering, Computer Science

Course level
First cycle

Advancement level
G2X

Course offered for
- Computer Science, Master's Programme
- Computer Science and Software Engineering, M Sc in Engineering
- Computer Science and Engineering, M Sc in Engineering
- Information Technology, M Sc in Engineering
- Biomedical Engineering, Master's programme

Specific information
This course cannot be included in the same degree as the courses TDDD12, TDDD46 or TDDD81.

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
The course requires thorough knowledge in programming, data structures and algorithms, and mathematics preferrably directed towards discrete mathematics or logics.

Intended learning outcomes

The aim of this course is to give a thorough introduction to the theoretical and practical issues underlying the design and implementation of modern database systems. After the completion of the course you should be able to:

- explain and use the most important terminology within databases and database technology in a correct way
- design a data model using EER diagrams.
- design, implement and use a relational database.
- explain the theory behind the relational model and how this affects good design of databases.
- explain which file structures in the database management system can be used to implement a database system.
- explain the basic principles for indexing a database and based on this design an efficient index for a database.
- explain which problems can occur when several users use the database and solutions to this.
- explain how a database can guarantee persistence of data and given desired properties explain how this is solved using recovery and back-up.
- explain the main principles behind heuristic query optimization and given a query compute the efficiency of the optimization.

Course content

Principles for general database management systems: DBMS, Methods for database design and use. Datamodelling with EER, Relational databases, Datastructures for databases, SQL, Relational algebra, query optimization, transactions, serialisation, concurrency.

Teaching and working methods

The course consists of lectures and laboratory work. Lectures are devoted to theory and techniques. Database design and implementation techniques are practised in the laboratory work.

Examination

LAB1	Laboratory work	3 credits	U, G
TEN1	Written examination	3 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

Supplementary courses

Advanced Data Models and Databases, Data mining

Department

Institutionen för datavetenskap

Director of Studies or equivalent

Patrick Lambrix

Examiner

Olaf Hartig

Course website and other links

Education components

Preliminary scheduled hours: 48 h
Recommended self-study hours: 112 h

Course literature

Additional literature

Books

Elmasri, R. and Navathe, S. B., *Fundamentals of Database Systems* 3e, 4e, 5e eller 6e upplagan Addison Wesley
NB: The title of the 6th edition is: Database Systems - Models, Languages, Design, and Application Programming.

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.