INFC20, Informatics: Advanced Database Systems, 7.5 credits

Informatik: Avancerade databassystem, 7,5 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus is an old version, approved by The Board of the Department of Informatics on 2013-09-20 and was last revised on 2016-06-03. . The revised syllabus applied from 2016-08-29. , autumn semester 2016.

General Information

The course can be taken as part of the BSc Programme in Information Systems Design, or as a separate course.

Language of instruction: English

Main field of studies	Depth of study relative to the degree requirements
Informatics	G2F, First cycle, has at least 60 credits in first-cycle course/s as entry requirements
Information Systems	G2F, First cycle, has at least 60 credits in first-cycle course/s as entry requirements

Learning outcomes

On completion of the course, students shall have acquired increased understanding of advanced data modelling and schema design as well as of the theories and techniques of database systems. On the basis of these techniques and modern development tools, the student shall have increased his or her ability to model, plan and implement database systems.

Knowledge and understanding
For a pass on the course, the student shall demonstrate knowledge of and understanding of

- techniques for optimising database searches

- different DBMS tools (Database Management Systems tools)
- problems and possibilities in database management, such as simultaneity, performance, dead-lock, dirty read and recovery management
- problems of working with different models for clients and servers
- principles for distributed databases
- normal forms and relations between data terms
- normalisation and problems of normalisation
- criteria for sound database design
- possibilities of designing integrity rules in databases.

Competence and skills

For a pass on the course, students shall demonstrate competence and skills individually or in groups to work with

- efficient techniques for storing, retrieving, saving and recovering data
- implementation of advanced solutions for relational databases, hybrid databases and object- oriented databases
- techniques for improving database performance with regard to the use of CPU and memory
- techniques for distributed databases
- database triggers and procedures
- design and quality control of operational data models utilising different modelling languages
- transformation of one operational data model to different implementation-oriented data models
- searches and other database operations in databases in different languages
- modelling and description of semi-structured data.

Judgement and approach

For a pass on the course, students shall demonstrate the ability to

- evaluate database models designed according to different criteria.

Course content

The following topics will be covered:

- problems of data modelling and transformation between models
- higher normal forms and problems with decomposition in normalisation
- advanced SQL (Structured Query Language)
- modelling of semi-structured data
- management of advanced integrity constraints
- transaction management
- recovery
- distributed databases
- database procedures and triggers
- optimisation/tuning of database systems
- hybrid databases (object-relational databases)
- object serialisation and XML in databases
- ORM (object-relational mapping)
- object databases
- the future of DBMS.

Course design

The teaching consists of lectures, lessons, laboratory sessions and supervision.

The course includes compulsory components, which are stated in the schedule.

Assessment

The assessment is based on written exam, case and assignments.

Re-examinations are offered in close conjunction with the first examination.

Cheating such as plagiarism, fabrication and falsification is considered a serious offence in higher education (see Chapter 8 of the Higher Education Ordinance). The disciplinary measures that may be taken as a result of such offences are caution or suspension for a limited period of time from the University.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, E, D, C, B, A.

Grade (Definition) Points or percentage out of maximum points. Characteristic.

A (Excellent) 85-100. A distinguished result that is excellent with regard to theoretical depth, practical relevance, analytical ability and independent thought.

B (Very good) 75-84. A very good result with regard to theoretical depth, practical relevance, analytical ability and independent thought.

C (Good) 65-74. The result is of a good standard with regard to theoretical depth, practical relevance, analytical ability and independent thought and lives up to expectations.

D (Satisfactory) 55-64. The result is of a satisfactory standard with regard to theoretical depth, practical relevance, analytical ability and independent thought.

E (Sufficient) 50-54. The result satisfies the minimum requirements with regard to theoretical depth, practical relevance, analytical ability and independent thought, but not more.

F (Fail) 0-49. The result does not meet the minimum requirements with regard to theoretical depth, practical relevance, analytical ability and independent thought.

To pass the course, the students must have been awarded the grade of E or higher.

Grading rules and definitions

Grades are awarded according to a graded scale from A (highest) to F (lowest), with E as the minimum passing grade.

When the exam/assignment is not graded, the grades G (Pass) or F (Fail) will be applied.

Course grades

When calculating course grades, the graded components will be weighted according to the following formula:

The number of credits for the exam is multiplied with the exam score. The total value is then divided by the total number of credits for the exams/assignments included. The resulting average is then rounded off to the nearest whole number. The number indicates the relevant course grade in accordance with the grading definitions above.

For exams/assignments which are graded and scored, the grades A to F will be used in accordance with the grading definitions above. The exam score will be used directly in the calculation.

For exams/assignments which are graded but not scored, the grades A to F will be used and converted as follows: A = 92, B = 80, C = 70, D = 60, E = 52.

Exams/assignments which are not graded but awarded with G (Pass) or F (Fail) will not be included in the calculation of the course grade.

Entry requirements

General and completed courses: "Informatics: Introduction to Information Systems, 1-30 cr" and "Informatics: Level 2, 31-60 cr" or the equivalent. English 6/English Course B.

An exception for the general entry requirement in Swedish will be granted when the course is given in English.

Further information

The course may be included in the BSc programme in Design of Information Systems, according to a decision by the programme director on 1 June 2011.

INFC20 may not be included in a degree together with INFC12, INFN12 or the equivalent.

It is compulsory to attend the introduction meeting, where a roll call will be taken. Absence without notification means that the admitted student will lose his/her seat on the course.

For transitional provisions with regard to previous courses, please contact the study advisor for an individual assessment.

If the course is discontinued, there may be limited opportunities for re-examination. Please contact the study advisor for information.

Amendments

2012-05-03: General redactional changes.
2015-12-04: Added that the course includes compulsory components and that attendance on the introduction meeting is compulsory.
2016-06-03: New grading rules from Autumn term 2016.

Subcourses in INFC20, Informatics: Advanced Database Systems

Applies from H11

1101   Written Test, 5,0 hp
           Grading scale: Fail, E, D, C, B, A
1102   Case, 1,5 hp
           Grading scale: Fail, Pass
1103   Assignments, 1,0 hp
           Grading scale: Fail, Pass