UNIVERSITY OF BORÅS

Datalogical Thinking
Datalogiskt tänkande
7.5 credits
7.5 högskolepoäng

Ladok Code: C3MDT1
Version: 2.0
Established by: Committee for Education in Librarianship, Information, and IT 2023-03-24
Valid from: Autumn 2023

Education Cycle: Second cycle
Main Field of Study (Progressive Specialisation): Information Science (A1N), Data and System Science (A1N)
Disciplinary Domain: Natural sciences
Prerequisites: Degree of Bachelor
Subject Area: Informatics/Computer and Systems Sciences
Grading Scale: Seven-degree grading scale (A-F)

Content

The course introduces basic data types, as well as some of the methods and techniques computers apply in order to store and process data. This includes learning how to apply algorithmic problem solving methods through a series of step-by-step instructions. The course also addresses the data and information-related prerequisites that are required for this type of problem solving, such as the representation of information, and the transmission of information over networks. Furthermore, the course will examine the way in which information is processed in different forms and levels of structuring, including data in text form, various serialization formats, and structured data in databases. Through this, students develop skills in 'datalogical thinking', which prepares them for the more technical aspects of the program. The students' ability to think datalogically is evaluated in a project assignment, where they design an algorithm that performs a simple task. This project is carried out in a digital collaboration environment that uses a version control system.

Learning Outcomes

Knowledge and understanding
1.1 explain basic data-related concepts in information science,
1.2 explain and handle basic data types,
1.3 explain how data can be structured in databases, and by using markup languages,
1.4 explain how data is transferred over networks using standardized protocols and data formats,
1.5 explain basic principles for algorithm design.

Competence and skills
2.1 demonstrate their ability to understand, manage and evaluate data in different modalities, sizes, and levels of complexity in different contexts,
2.2 demonstrate their ability to use, understand and analyze different serialization formats and databases,
2.3 use pseudocode to formulate a simple algorithm,
2.4 collaborate in a digital project by using a digital collaboration environment.

Judgement and Approach
3.1 reason critically about the risks and ethical implications that the application of algorithmic problem solving can entail.

Forms of Teaching

The teaching methods of this course consist of:
- lectures
- workshops
- seminars

The language of instruction is English.

Forms of Examination

The course will be examined through the following examination elements:

Written assignment: Structuring data
Learning outcomes: 1.1-1.4, 2.1-2.2
Credits: 2
Gradingscale: Fail (U) or Pass (G)

Project: Algorithm design (group assignment)
Learning outcomes: 1.5, 2.2-2.4, 3.1.
Credits: 4.5
Gradingscale: Seven-degree grading scale (A-F)

Seminar: Social and ethical implications when applying algorithmic problem solving strategies
Learning outcomes: 3.1
Credits: 0.5
Gradingscale: Fail (U) or Pass (G)

Written assignment: Individual project reflection
Learning outcomes: 1.5, 2.3
Credits: 0.5
Gradingscale: Fail (U) or Pass (G)

For a passing grade (A-E) on the entire course, the grade Pass (Godkänd) is required on *Written assignment: Structuring data, Seminar: Social and ethical implications when applying algorithmic problem solving strategies* and *Written assignment: Individual project reflection* together with at least grade E on *Project: Algorithm design (group assignment).* A higher grade on the entire course is thereafter determined by the grade on *Project: Algorithm design (group assignment).*

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 Materials

The course literature is in English.

Dale, N., & Lewis, J. (2020). Computer science illuminated. (7th ed. or later). Jones & Bartlett Learning. (selected parts; approx. 300 pp.)

Scientific articles and reference material are added according to the teacher's instructions (approx. 250 pages).

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

The course is a part of Master's Programme in Information Science: Digital Environments.

This syllabus is a translation from the Swedish original.