



DD2488 Compiler Construction

9.0 credits

Kompilatorkonstruktion

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

The official course syllabus is valid from the Autumn semester 2023 in accordance with Head of School decision: J-2023-1526. Decision date: 12/06/2023

Decision to discontinue this course

The course will be discontinued at the end of HT 2024 according to the Head of school decision: J-2023-1526. Decision date: 2023-06-12. The course was given for the last time in Autumn 2022. The last opportunity for examination in the course is given in Autumn 2024. Students who wish to complete the course after it has been given for the last time should contact the examiner.

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Computer Science and Engineering

Specific prerequisites

Single course students:

SF1671 Mathematics, Basic course, with Discrete Mathematics, DD1337 Programming, DD1338 Algorithms and Data Structures, DD1352 Algorithms, Data Structures and Complexity, IS1200 Computer Hardware Engineering or corresponding courses

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The student should be able to

- explain the steps involved in the compilation process, from source code to target code,
- understand a given grammar or regular expression and determine which strings belong to the corresponding formal language,
- write regular expressions and grammars for various formal languages, such as programming languages,
- choose an appropriate formal notation to describe a given formal language,
- explain LL-analysis and LR-analysis,
- use scanner and parser generators,
- explain the aspects of the architecture of a computer or a virtual machine relevant to a compiler,
- write programs that perform various steps of the compilation process.

Course contents

Describing programming languages and other formal languages using regular expressions and grammars.

Methods for lexical and syntax analysis and their relationships to models of computation such as finite automata and pushdown automata. Syntax analysis using LL and LR parsing. Tools such as scanner and parser generators.

Semantic analysis, translation into intermediate code, instruction selection and register allocation.

Examination

- PRO1 - Project, 5.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 4.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.