



# DD1360 Programming Paradigms 4.5 credits

## Programmeringsparadigm

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-2023-1524. Decision date: 12/06/2023

## Decision to discontinue this course

The course will be discontinued at the end of the Spring semester 2025 according to Head of School decision: J-2023-1524. Decision date: 2023-06-12. The course was given for the last time in Spring 2023. The last opportunity for examination in the course is given in the Spring semester 2025. The examination is carried out during the transition period within the framework of the course DD1366. Course module MAS1 in DD1360 is replaced by course module MAS1 in DD1366. The laboratories in LAB1 can be presented during the regular course round of DD1366 and in the lab week in June.

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

Knowledge and skills in programming, 6 credits, equivalent to completed course DD1337/DD1310-DD1318/DD1321/DD1331/DD100N/ID1018.

Knowledge in foundations of computer science, 6 credits, equivalent to completed course DD1338/DD1320-DD1327/DD2325/ID1020/ID1021.

Active participation in a course offering where the final examination is not yet reported in LADOK is considered equivalent to completion of the course.

Being registered for a course counts as active participation.

The term 'final examination' encompasses both the regular examination and the first re-examination.

## Language of instruction

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

## Intended learning outcomes

After passing the course, the student should be able to:

- apply and explain general concepts in programming, in particular flow of control, recursion, interpretation, paradigms and models of computation
- apply and explain basic concepts in functional programming, in particular pure functions, referential transparency, higher order functions, immutability, types
- apply and explain basic concepts in formal languages and syntax analysis, in particular automata, regular expression, grammars, lexical analysis and recursive descent

in order to

- obtain a broader perspective on programming
- be able to assess which paradigm and which programming language that is appropriate to solve a certain assignment
- be able to use adequate programming style in a chosen programming paradigm
- be able to participate in discussions about programming paradigms, history of programming languages, language definition, properties of type systems, principles of language design, language translation, programming principles and programming concepts actively

## Course contents

Functional programming: the function concept, higher order functions, currying, evaluation strategies, streams, pattern matching, overloading, polymorphism, interpretation, lazy evaluation, types and type classes.

Formal languages and syntax analysis: automata, regular expressions, grammars, lexical analysis, recursive descent, classes of languages.

Language translation: interpretation, compilation and linking.

Programming paradigms control flow, subprograms, recursion, classes, types, computational models and memory models

## Examination

- LAB1 - Laboratory work, 2.0 credits, grading scale: A, B, C, D, E, FX, F
- MAS1 - Mastery tests, 2.5 credits, grading scale: P, 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.

Mastery tests are individual assignments that are reported both in writing and orally

## 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.