



# DD2481 Principles of Programming Languages 7.5 credits

Principer för programspråk

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

## Establishment

The official course syllabus is valid from the autumn semester 2021 in accordance with Head of School decision: J-2021-0878. Decision date: 15/04/2021

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Computer Science and Engineering

## Specific prerequisites

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## Language of instruction

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

# Intended learning outcomes

After completion of the course, the student should be able to:

- formally describe languages and program behavior,
  - precisely reason about state, effects, and mutation,
  - reason about and use mechanisms for abstraction and modularization,
  - define type systems formally,
  - prove type soundness,
  - reason about program equivalence,
  - define and reason about contracts,
  - discuss open questions about advanced language features and reflect critically over them,
  - write programs that implement various formalisms, mechanisms and language features in order to
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- be able to take part in deeper discussions about principles of programming languages,
  - be prepared for courses in compiler construction.

# Course contents

Formal languages, finite automata, context free grammars.

State, scope, extent, static and dynamic information, effects, mutability.

Basic operational semantics.

Abstraction mechanisms, modularity, contracts.

Types, invariants, program equivalence.

Tools for program analysis.

Examples of advanced features of programming languages.

# Examination

- TEN1 - Examination, 2.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory assignments, 3.5 credits, grading scale: P, F
- UPP1 - Essay, 1.5 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.

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

## **Other requirements for final grade**

Passed laboratory assignments, thesis and examination

## **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.