# ID2204 Constraint Programming 7.5 credits

**Villkorsprogrammering**

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

## Establishment

On 2019-10-15, the Head of School of EECS has decided to establish this official course syllabus to apply from the spring semester 2020 (registration number J-2019-0619).

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Information Technology, Computer Science and Engineering

## Specific prerequisites

Courses in basic computer science, discrete mathematics, algorithms and data structures. Basic proficiencies in object-oriented programming (for example: in Java or C++).

## 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 shall be able to

- use techniques to model and solve constraint problems
- explain the principles that form the basis for techniques to solve constraint problems
- explain the main merits and the limitations with constraint programming and how constraint programming relates to other methods.

## Course contents

The course acts to model and solve combinatorial (optimisation) problem by means of constraint programming. There are combinatorial problems everywhere, for example to assign and timetable resources, design instructions for processors and optimise instruction scheduling at compilation. This course teaches the basic concepts in constraint programming, applications, expansions and its relation to other technologies for combinatorial optimisation.

- To model with constraint programming.
- Basic solution methods: propagation and search.
- Technologies for modelling, refinement of models, heuristic search methods, application to problems of industrial size.
- Basic principles of constraint programming: models for propagation and search and their essential properties; different levels of propagation; different constraint domains; strong algorithmic methods for propagation.
- Relation to other technologies to solve combinatorial problems (integer programming, local search), discussion of merits, limitations and hybrid variants.

## Examination

- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 3.0 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.

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

## 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.