

# Introduction to Programming and Computational Thinking

Programme course

6 credits

Introduktion till programmering och datalogiskt  
tänkande

TDDE04

Valid from: 2019 Spring semester

**Determined by**  
Board of Studies for Mechanical  
Engineering and Design

**Date determined**  
2018-08-31

## Main field of study

Computer Science and Engineering

## Course level

First cycle

## Advancement level

G1X

## Course offered for

- Master of Science in Design and Product Development
- Master of Science in Mechanical Engineering
- Bachelor of Science in Mechanical Engineering
- Master of Science in Energy - Environment - Management

## Intended learning outcomes

Advanced software simulation for design, construction and calculation are now common components in engineering. These simulation tools are also programming platforms and writing code enable the engineer to generate, visualize, and seek solutions using algorithms. Programming can become a basis for computational thinking in design, construction and calculation where the engineer writes programs to address creative tasks. The purpose of the course is that students acquire basic knowledge in programming and develop an understanding for the role of programming in modern engineering.

After completing the course, students should be able to:

- design and implement simple algorithms in a programming / scripting language (such as Python) commonly used in design and construction simulation
- explain basic concepts in programming and computational thinking, and
- describe how scripts can be used to generate and explore alternative design solutions for engineering tasks.

## Course content

Basic concepts of programming and computational thinking

Basic data and program structures

The basics of Python programming language

Design and construction of 2D and 3D object programming tool such as Blender

Modelling of the design problems in the form of computer program

## Teaching and working methods

The course consists of lectures, introduction to programming and presentation of code solutions in seminars.

## Examination

PRA1	Individual assignment	2 credits	U, G
LAB1	Laboratory work	2 credits	U, G
UPG1	Assignments	2 credits	U, G

Grades are given as 'Fail' or 'Pass'.

## Grades

Two grade scale, older version, U, G

## Department

Institutionen för datavetenskap

## Director of Studies or equivalent

Jalal Maleki

## Examiner

Erik Berglund

## Education components

Preliminary scheduled hours: 52 h

Recommended self-study hours: 108 h