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 amd 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