Linnæus University

Jnr: 2016/3951-3.1.2.2

Course syllabus

Faculty of Technology
Department of Computer Science and Media Technology

2DV910 Introduktion datalogiskt tänkande, 7,5 högskolepoäng
Introduction to Computational Thinking, 7.5 credits

Main field of study
Computer Science

Subject Group
Informatics/Computer and Systems Sciences

Level of classification
First Level

Progression
G2F

Date of Ratification
Approved by Faculty of Technology 2016-06-30
The course syllabus is valid from spring semester 2017

Prerequisites
90 credits, 60 credits within a single subject

Objectives

After completion of the course the student is expected to be able to:
1. Knowledge and understanding

- Explain program language concepts such as expressions, operators, control flow, etc.
- Explain the meaning and use of elementary data structures such as lists, sets, dictionaries, etc.
- Show awareness of what kind of problems programming can help solve in their field of study

2. Skills and abilities

- Break down a problem into steps that can be solved by a computer
- Formulate and implement algorithms for each of the steps
- Develop small software applications in Python

3. Judgement and approach

- Reflect on choices made during the implementation of the program and what effect these might have
- Reflect on the limitations of the program and the consequences that errors might have

Content

The course gives a broad introduction to programming in Python and computational thinking for students with degrees outside computer sciencefor students with degrees outside computer science. The first part of the course will focus on the Python programming language. It will introduce fundamental concepts, such as data structures and functions, and illustrate how to use them in Python. The second part of the course will focus on computational thinking, how to create and use different levels of abstraction to solve a problem. The third part of the course will focus on how to use Python and computational thinking to solve problems from your field of study. It will introduce existing Python packages and show how to, e.g., access, mine, and visualize data.

Type of Instruction

The instruction will be based on the "flipped classroom" model, where students have access to video lectures and interactive exercises that they should watch and try to solve before the lecture. The lecture will then focus on discussion on the content of the video lectures and solutions the exercises.

Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.
The course is assessed with the grades A, B, C, D, E, Fx or F.?The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

The course will be examined in two parts: assignments and a final project. The assignments are examined by written solutions to compulsory problems handed during the course. Assignments is normally carried out in groups of two students. The final project is examined by a written report that describes the purpose of the project, the results, and a critical reflection of the implemented solution. The project is normally carried out in groups of four students.

Course Evaluation

An anonymous questionnaire is used evaluate the course. The outcome of the evaluation serves to improve the course by indicating which parts could be added, improved, changed or removed.

Other

Students must have access to a laptop or tablet computer that can run Python 3.

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material

Al Sweigart, Automate the Boring Stuff with Python: Practical Programming for Total Beginners (2015), No Starch Press, ISBN-13 978-1593275990 (320 pages)