Introduction to Computer Programming

Programme course

8 credits

Programmering, grundkurs

TDDE44

Valid from: 2020 Spring semester

Determined by
Board of Studies for Electrical Engineering, Physics and Mathematics

Date determined
2019-09-23

Main field of study
Computer Science and Engineering, Computer Science

Course level
First cycle

Advancement level
G1N

Course offered for
- Master of Science in Biomedical Engineering
- Master of Science in Applied Physics and Electrical Engineering
- Bachelor's Programme in Mathematics

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Basic computer skills.

Intended learning outcomes
The intended purpose of this course is to facilitate and provide students with fundamental skills and knowledge pertaining to computer programming and an introduction to Computer Science. After having completed the course, the student should be able to:

- Make use of the computing environment for tasks related to programming and building basic programs
- Explain fundamental concepts related to computer science, programming, and programming languages
- Solve programming related problems by applying an interactive approach to implementation, testing and troubleshooting
- Construct abstractions using varying degree of support provided by the programming language
- Solve programming problems by breaking them down into smaller sub-problems
- Construct recursive and iterative algorithms

Course content

- A general introduction to Computer Science
- Programming fundamentals: expressions, basic datatypes, variables, functions, control structures, file management, file formats, modules
- The Python programming language
- Use of open data resources from the web
- Interactive and incremental program development
- Testing and troubleshooting
- Programming paradigms: functional, imperative and object-oriented programming
- Abstraction: Data and program abstraction

Teaching and working methods

The course consists of lectures, tutorials and laboratory sessions. Concepts and their applications are treated during lectures and tutorials. Practical skills and abilities are practiced during laboratory sessions by solving programming exercises. The course setup requires a high degree of student activity and that students engage in private studies outside of the scheduled classes.

Examination

LAB2	Data and program abstraction/intro to object-oriented programming	3 credits	U, G
LAB1	Fundamentals in programming and computer system	3 credits	U, G
DAT1	Computer examination	2 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

Supplementary courses: Programming - data structures and algorithms. Data and program structures.

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is Swedish, the course as a whole or in large parts, is taught in Swedish. Please note that although teaching language is Swedish, parts of the course could be given in English. Examination language is Swedish.
- If teaching language is Swedish/English, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English (depending on teaching language).
- If teaching language is English, the course as a whole is taught in English. Examination language is English.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

Department

Institutionen för datavetenskap

Director of Studies or equivalent

Jalal Maleki

Examiner

Jody Foo

Course website and other links

http://www.ida.liu.se/

Education components

Preliminary scheduled hours: 66 h
Recommended self-study hours: 147 h

Course literature

Additional literature

Books

Lutz, Mark, (2013) *Learning Python* 5. ed. Sebastopol, Calif. : O'Reilly, 2013
ISBN: 9781449355739
Punch, W. F., Enbody, Richard J., (2017) *The practice of computing using Python* Third Edition. Boston, Mass. : Addison-Wesley/Pearson
Zelle, John M., (2010) *Python programming : an introduction to computer science* 2nd ed. Sherwood, Or. : Franklin, Beedle & Associates, 2010
ISBN: 9781590282410
Zelle, John M., (2017) *Python Programming : An Introduction To Computer Science* Third Edition. Franklin, Beedle & Associates, 2017.
ISBN: 9781590282755, 1590282752