



EL2310 Scientific Programming

7.5 credits

Programmeringsteknik

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

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

Establishment

Course syllabus for EL2310 valid from Autumn 2012

Grading scale

P, F

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

For single course students: 120 credits and documented proficiency in English B or equivalent.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The goal of the course is to give the participants basic knowledge in programming and then specifically in MATLAB, C and C++.

After completing the course the participants should:

- have an understanding for the basic concepts in programming
- be able to read in, process and display data in MATLAB
- solve problems and implement algorithms in MATLAB
- be skilled enough using MATLAB so that it does pose a problem in other courses that rely on the participants knowing MATLAB
- be able to read in and process data in programs written in C and C++
- solve problems and implement algorithms in C and C++
- understand what simpler programs written in C or C++ does, i.e., be able to read and understand existing code
- have an understanding for the importance of writing code that others can understand to be able to change, correct errors and build upon

Course contents

The course focuses on giving the participants the tools that are needed to work in research and development in an environment where computers are becoming increasingly more important. To instruct computers programming is needed.

The following will be covered in the course: basic concept in programming (variables, functions, objects, classes, etc), programming, input/output of data, processing of data and visualisation in MATLAB, programming, input/output of data and processing in C/C++, basic concepts in object oriented programming.

Disposition

The exact lecture distribution will be updated along the course, but a rough outline is :

- Introduction: course outline, motivating examples, [L1]
- MATLAB using it as a tool and programming [L2-L5]
- Programming in C [L6-L12]
- Programming in C++ [L13-L16]

Course literature

Det finns ingen kursbok. Föreläsninganteckningar distribueras online

För de studenter som trots allt önskar en bok rekommenderas

- **MATLAB**
F. Gustafsson och N. Bergman, Matlab for Engineers Explained, Springer Verlag, 2003 (ISBN 1-85233-697-8)
- **C**
Kernighan and Ritchie, The C programming language, 2nd edition, Prentice Hall (ISBN 0-13-110362-8)
- **C++**
Stroustrup, The C++ programming language, Addison Wesley

Examination

- LAB1 - Programming in MATLAB, 2.5 credits, grading scale: P, F
- LAB2 - Programming in C, 2.5 credits, grading scale: P, F
- LAB3 - Object Oriented Programming, 2.5 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.

- LAB1 - Programming in MATLAB, 2.5 credits, grade scale: P, F
- LAB2 - Programming in C, 2.5 credits, grade scale: P, F
- LAB3 - Object Oriented Programming, 2.5 credits, grade scale: P, F

Other requirements for final grade

To pass the course the student need to successfully complete the three projects, MATLAB, C and C++ individually.

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.