Linnæus University

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# Course syllabus

Faculty of Technology
Department of Computer Science

## 1DV433 Strukturerad programmering med C++, 7,5 högskolepoäng
## Structured programming with C++, 7.5 credits

**Main field of study**
Computer Science

**Subject Group**
Informatics/Computer and Systems Sciences

**Level of classification**
First Level

**Progression**
G1N

**Date of Ratification**
Approved 2009-06-23
Revised 2016-06-15 by Faculty of Technology. Objectives, conten, type of instructions, examination and literature are revised.
The course syllabus is valid from autumn semester 2016

**Prerequisites**
General entry requirements.

## Objectives

Aim of the course is for student to acquire knowledge and develop basic skills in structured programming with C++.

After finished course, the student shall be able to:

- account for different data types and simple data structures (1)
- use variables, expressions, statements and control structures appropriate to the context (2)
- create and use functions (3)
- manage dynamically allocated memory (4)
- manage input and output, as well as text and binary files (5)
- write code that complies with the requirements for good code quality (6)
- analyze a simple programming task in order to evaluate and select a suitable design and implement a well-functioning solution (7)

## Content

The course consists of two modules.

***Module 1 Theory 3.5 credits***
Theory module covers the following elements:

- input and output
- simple data types, strings, arrays, structures, user defined types
- control structures for selection and iteration
- functions with and without a return value, data transmission through
- parameters
- pointers and dynamically generated variables
- text files and binary files

***Module 2 Practical assignments 4 credits***
In the practical module, the theoretical concepts are applied through analyzing given problems, which are then structured and solved with appropriate program logic according to techniques covered in current step. This means that the student applies the learned theory by creating their own applications written in C++. A large number of programming tasks are provided, among which the student selects difficulty level according to interest and ambition.

## Type of Instruction
The course is conducted entirely at a distance and is based on independent studies of the assigned literature and web based study material. The study material deals with the theory, as well as the students are assigned practical tasks in which the knowledge is applied. For the practical applications is offered personal online tutoring sessions. Since only web-based communication is applied in this distance learning course, the student is required to have own access to computer, headset, webcam and internet connection.

The course is divided into 6 steps that build on each other. Each step includes a number of practical tasks of varying difficulty and extent, which are graded 1-3 points. To pass the student should perform and report tasks, which in total shall reach a certain score, determined for each step. Hence the student can choose difficulty level and tasks of their own interest and ambition.

Each step ends with a theoretical test, carried out online in a web-based test tool according to instructions given on the course web. Failed step test can be reexamined at least twice, normally in connection with the next regular examination session.

## Examination
The course is assessed with the grades U,3,4 or 5.
Module Practical applications (4 credits): Objectives 1-7 are examined on an ongoing basis, through written presentations of programming tasks. The grades U (Fail) and G (Passed) are applied.

Module Theory (3.5 credits): Objectives 1-5 are examined stepwise and ongoing, through tests with multiple choice questions. The tests are individual and computer-based and carried out from optional location. All aids are allowed, except communications with another individual. The grades U (Fail) and G (Passed) are applied.

Final grade is given after completion of the course and based on an overall assessment of respective examination results from the two modules (Theory and Practical Applications).

The grades U (Fail), 3, 4 and 5 are applied for the final grade and are based on grading criteria which are published on the course website. For grade 3, the G (Passed) level for respective examination module must be achieved. For higher grade than 3 is mainly required that the practical applications are implemented on a more advanced level and meeting the quality requirements in a satisfactory manner. Also the theoretical result should support the corresponding level.

Students at Linnaeus University are entitled to have the course grade translated into the seven-graded ECTS scale. In order to have the grades translated, the student shall submit a request to the course management at the start of the course.

Reexamination is offered within six weeks under the regular semester periods.

## Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

## Required Reading and Additional Study Material

- Schildt, Herbert (2014): C++ from the ground up, Fourth Edition (McGraw-Hill/Osborne Media), ISBN-10: 0071634827 (In agreement with the course coordinator, an alternative primer C++ programming book is acceptable to use.)
- Additional web-based study materials are provided on the course website.