# Programming in C++

## Programme course

6 credits

Programmering i C++

TNG033

Valid from: 2017 Spring semester

**Determined by**
Board of Studies for Computer Science
and Media Technology

**Date determined**
2017-01-25

## Main field of study
Computer Science and Engineering

## Course level
First cycle

## Advancement level
G2X

## Course offered for
- Media Technology and Engineering, M Sc in Engineering
- Electronics Design Engineering, M Sc in Engineering
- Communication and Transportation Engineering, M Sc in Engineering

## 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
Programming, Object-Oriented Programming.

## Intended learning outcomes
The aim of the course is to equip students with the necessary knowledge to develop programs in C++. To pass the course, the student must fulfill following learning outcomes:

- To use pointers and dynamic memory allocation.
- To program dynamic data structures.
- To write object oriented programs with inheritance, association and aggregates.
- To use polymorphism and dynamic binding.
- To define classes with overloaded operators.
- To write and use class/function templates.
- To write programs using different types of streams.
- To use data structures, algorithms and iterators from the C++ standard library

## Course content
Pointers and dynamic memory allocation/deallocation. Singly-linked lists. Classes and inheritance. Constructors and destructors. Operator overloading. Friends. Virtual functions. Abstract classes. Streams and data files. Templates. Namespaces. C++ standard library: container classes, iterators, and algorithms.

## Teaching and working methods
Lectures, lessons, laboratory work.

## Examination

| | | | |
|---|---|---|---|
| LAB1 | Laboratory work | 3 credits | U, G |
| DAT1 | At-computer exam | 3 credits | U, 3, 4, 5 |
| UPG2 | Voluntary assignment | 0 credits | U, G |

The computer exam consists of three parts. Passed Part 1 gives grade 3. Approved in Part 1 and Part 2 gives grade 4. Approved on all parts gives grade 5. The optional assignment consists of two quizzes. Approved on all quizzes will be credited to the portion of the computer exam that gives grade 3. For higher grades the rest of the computer exam must be conducted and passed.

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

## Other information
Supplementary courses: Data structures, Software Engineering, Design patterns

## Department
Institutionen för teknik och naturvetenskap

## Director of Studies or equivalent
Camilla Forsell

## Examiner
Aida Nordman

## Course website and other links
http://www2.itn.liu.se/utbildning/kurs/index.html?coursecode=TNG033

# Education components

Preliminary scheduled hours: 60 h
Recommended self-study hours: 100 h

# Course literature

## Additional literature

### Books

Jan Skansholm, *C++ direkt* 3. upplaga

# Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.