

## Programming in C++ (E765019)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)  
Credits 3.0 Study time 90 h Contact hrs 30.0 h

### Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	Dutch	Gent	teaching methods	hours
			seminar: practical PC room classes	9.0 h
			online seminar: practical PC room classes	6.0 h
			online lecture	15.0 h

### Lecturers in academic year 2020-2021

Naessens, Helga	TW05	lecturer-in-charge
Van Den Breen, Wim	TW05	co-lecturer

### Offered in the following programmes in 2020-2021

programme	crdts	offering
<a href="#">Master of Science in Electrical Engineering Technology (main subject Automation)</a>	3	A

### Teaching languages

Dutch

### Keywords

Informatics, Programming Language, Object oriented Programming, C++, Computer Science (P170), Informatics (P175), Computer Technology (T120).

### Position of the course

An in-depth course in C++ for those already familiar with programming in C.

### Contents

- An in-depth and a rather complete survey of C++, including the following topics:
- Basic concepts: basic data types, reference type, function templates, console input and output, namespaces, working with files, dynamic file management
  - Collections: introduction, iterators, sequences, sequence adapters, associative containers
  - Basic OOP in C++: classes in C++, class templates, constructor-destructor, copy constructor, separate compilation, objects as instance variables, friend functions and classes, operator overloading
  - Inheritance in C++: public versus private inheritance, constructors/destructor in derived classes, overriding =-operator, keyword protected, polymorphism and dynamic binding, abstract classes, virtual destructor, multiple inheritance
  - Exception handling
  - Automatic type derivation, initialization syntax, move constructor and move operator, defaulted and deleted functions, functions as parameters and lambda functions, nullptr, smart pointers (unique\_ptr and shared\_ptr)

### Initial competences

A good experience in object oriented programming with some programming language (like for example Java).  
Programming skills in C: basic concepts, pointers, structs, dynamic memory management, linked lists, bit fiddling.  
Having followed the course programming in C.

### Final competences

- 1 To be able to independently implement, test and execute a computer program in

C++.

- 2 To be able to transform an object oriented design into a working computer program in C++.
- 3 To be able to analyze and to structure a problem and to translate it into a computer program in C++.

#### Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

#### Conditions for exam contract

This course unit cannot be taken via an exam contract

#### Teaching methods

Seminar: practical PC room classes, online lecture, online seminar: practical PC room classes

#### Extra information on the teaching methods

During the lectures (15 h) the theory is explained step by step, partly based on examples.

During the exercise sessions (15 h) the student works independently on a PC.

#### Learning materials and price

Slides, examples and exercises with solutions are provided on the electronic learning environment.

Book (English) "C++ Primer, 5th Edition, Lippman & Lajoie & Moo, Addison-Wesley".  
Purchase without obligation. Estimated cost: max. 55 euro

#### References

- C++ Primer, 5th Edition, S.B. Lippman, J. Lajoie, B. Moo, ISBN 978-0-3217-1411-4
- A Tour of C++, 2/E, Bjarne Stroustrup, ISBN 978-0-1349-9783-4
- Problem Solving with C++: Global Edition, 10/E, Walter Savitch & Kenrick Mock, ISBN 978-1-2922-2282-0

#### Course content-related study coaching

Additional explanation on appointment.

#### Evaluation methods

end-of-term evaluation

#### Examination methods in case of periodic evaluation during the first examination period

Written examination with open questions

#### Examination methods in case of periodic evaluation during the second examination period

Written examination with open questions

#### Examination methods in case of permanent evaluation

#### Possibilities of retake in case of permanent evaluation

not applicable

#### Extra information on the examination methods

The exam is a practical exam, consisting mainly of exercises, probably complemented by a few theoretical questions.

#### Calculation of the examination mark

Written examination (100%).