Object Oriented Programming (C++) for Physicists (C003215)

Course size   *(nominal values; actual values may depend on programme)*

     Credits 6.0   **Study time 180 h**

Course offerings in academic year 2024-2025

     A (semester 2)   English   Gent

Lecturers in academic year 2024-2025

     Devroede, Olivier   VUB   lecturer-in-charge

Offered in the following programmes in 2024-2025	crdts	offering
Master of Science in Teaching in Science and Technology(main subject Physics and Astronomy)	6	A
Master of Science in Physics and Astronomy	6	A

Teaching languages

     English

Keywords

Position of the course

Contents

     1) C++

     Vocabulary learning or translation: what are the basic structures in this language. A quick comparison is made between the programming languages the student knows and what this structure becomes in C++

     2) Pointers etc.

     What are pointers? How do we use them? Pitfalls and solutions.

     3) OO programming

     ADT: abstract data types, inheritance, classes, objects, …

     4) OO in C++

     classes, constructor, destructor, templates, …

     5) STL: Standard template library

     Why we need an extension to C++, definition and use of 'vector' and generic algorithms within STL

     6) network

     Basic networking via tcp/ip. implementation of a client server in C++, …

     7) GUI: graphical user interface

     The graphical library QT with its sdk (software development kit) will be studied. It will serve as the basis for the programming project. Elements of GUI building will be learned.

Initial competences

     Students must have followed at least a course in functional programming. The programming language used in this course is of no importance.

Final competences

     1 The goal of the course is to learn basic object oriented (OO) programming techniques as implemented in C++.

     2 The students are able to use pointers in C++.

     3 The students are able to define classes, make objects with these and to use them properly.

     4 Students are able to craft their classes in such a way that it respects the basis

OO principles.

5 Students are able to use these principle to construct an algorithm.

6 Using these basic skills, students are able to construct a larger project.

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, Lecture

Study material

None

References

Course content-related study coaching

Assessment moments

end-of-term assessment

Examination methods in case of periodic assessment during the first examination period

Oral assessment

Examination methods in case of periodic assessment during the second examination period

Oral assessment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

Examination consists of an oral defense of the code written. The code is a project that the student can choose as an application within the field of physics. It is looked at how the elements given in the course have been used in the larger unit that makes up the project.

Calculation of the examination mark

Oral Exam determines 100% of the final mark.