Modules:

physics70a **Elective Advanced Lectures: Experimental Physics**
physics70b **Elective Advanced Lectures: Applied Physics**

Course: C++ Programming in High Energy Physics (E/A)

Course No.: physics718

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	2+1	4	ST

Requirements for Participation:

Preparation:
Basic knowledge of programming and knowledge of simple C++ or C constructs.

Form of Testing and Examination:
Requirements for the examination (written or oral): successful work with the exercises.

Length of Course:
1 semester

Aims of the Course:
In-depth understanding of C++ and its applications in particle physics. Discussion of advanced features of C++ using examples from High Energy Physics. The course is intended for students with some background in C++ or for advanced students who wish to apply C++ in their graduate research.

Contents of the Course:
Basic ingredients of C++
Object orientation: classes, inheritance, polymorphism
How to solve physics problems with C++
Standard Template Library
C++ in Data analysis, example: the ROOT library
C++ and large scale calculations
How to write and maintain complex programs
Parallel computing and the Grid
Debugging and profiling

Recommended Literature:
Eckel: Thinking in C++, Prentice Hall 2000.
Lippman, Lajoie, Moo: C++ Primer, Addison-Wesley 2000.
Deitel and Deitel, C++ how to program, Prentice Hall 2007.
Stroustrup, The C++ Programming Language, Addison-Wesley 2000.

Credit points can only be earned from one exam out of physics718 and physics725