

Program of Studies:	Master Program Bioinformatics
Name of the module:	Programming Course
Abbreviation:	PBI-M-1
Subtitle:	-
Modules:	Lecture and tutorial
Semester:	1st semester / every winter semester
Responsible lecturer:	Prof. Dr. Andreas Keller
Lecturer:	Dr. Christina Backes, M.Sc. Tobias Fehlmann
Language:	English
Level of the unit/ Mandatory or not :	mandatory
Course type/weekly hours:	Lecture: 2 h (weekly) Tutorial: 2 h (biweekly)
Total workload:	150 h = 60 h of classes and 90 h private study and assignments
Credits:	5
Entrance requirements:	none
Aims/Competences to be developed:	In this course students will learn how to program in C++. They will get familiar with the various programming concepts offered by C++, common pitfalls in the language and how to avoid them. They will learn how to test, debug and profile their code. Further the basics of multi-threading and how to write efficient code will be taught. Finally the students will learn how to integrate C++ in scripting languages.
Content:	<ul style="list-style-type: none"> • Language specification • Object-oriented programming • Effective C++ • STL • Boost • Testing, debugging, profiling • Threading • Metaprogramming • Optimization techniques • C++ in scripting languages

Assessment/Exams:	About 5 assignments. Reaching a total of at least 50% of the points of the assignments is required to be admitted to the oral exam. To pass the exam a score of 50% is needed.
Used media:	Powerpoint presentation
Literature:	Lecture slides can be downloaded from the webpage of the lecture. The lecture will partially be based on the following books: <ul style="list-style-type: none"> - Programming: Principles and Practice Using C++ by Bjarne Stroustrup - Der C++ Programmierer. C++ lernen - Professionell anwenden - Lösungen nutzen by Ulrich Breymann - Effective Modern C++: 42 Specific Ways to Improve Your Use of C++11 and C++14 by Scott Meyers