CO4105/CO7105 Advanced C++ Programming

Credits: *15* **Convenor:** *Dr. Yi Hong and Dr. R. Dimitrova* **Semester:** *1st*

Prerequisites: *none*

Lectures: *14 hours*
Tutorials: *7 hours*
Laboratories: *14 hours*
Independent Study: *77.5 hours*

Assessment: *Coursework: 100%*

Subject Knowledge

Aims This module teaches advanced C++ programming.

Learning Outcomes Students should be able to: understand the components of a C++ program, the structures required to write advanced programs, and the ideas of object orientation.

Methods Class sessions, recommended textbook and worksheets.

Assessment Marked coursework.

Skills

Aims To develop design, analysis and problem solving skills.

Learning Outcomes Students will be able to apply their C++ skills to solve computing problems.

Methods Class sessions together with worksheets.

Assessment Marked coursework.

Explanation of Prerequisites It is assumed that students are already familiar with a programming language such as Fortran, Python or C. Students with little previous programming experience will be required to attend 24 additional hours of programming lectures and laboratories at the start of the course.

Module Description Over the past 32 years C++ has become one of the world's most popular programming languages, due to its potential for producing efficient and compact code. As such any programmer wishing to develop efficient programs should be familiar with the use of its central features. In addition, object orientation, has become a central dogma in programming languages. This module is intended to give the student a basic grasp of the use of C++ and the underlying principles of object oriented programming.

The module covers important aspects of object oriented programming and object oriented design. Assessment is done by programming exercises giving students an opportunity to practice the taught principles and improving their programming skills.

Syllabus

- Introduction to C++.
- Strings and Streams.
- Classes, constructors and destructors.
- Pointers, arrays and references.
- Exceptions.
- Methods and operators.

- Overloading.
- Templates and inheritance.
- The Standard Template Library and its data structures.
- Functional C++.

Reading List

[A] John R. Hubbard, *Programming with C++, 2nd edition; Shaum's Outlines; ISBN 007135346-1,* McGraw Hill.

[C] Bjarne Stroustrup, *The C++ Programming Language, 4th edition; ISBN: 0321563840,* Addison-Wesley, 2013.

[C] Andrew Koenig and Barbara E. Moo, *Accelerated C++; ISBN: 0-201-70353-X,* Addison Wesley, 2001.

Resources Course notes, web page, study guide and worksheets.

Module Evaluation Course questionnaires, course review.