The Hong Kong University of Science and Technology

UG Course Syllabus

Course Title: Object-Oriented Programming and Data Structures

Course Code: COMP 2012

No. of Credits: 4 credits

Pre-requisites: COMP 2011

Name: CHAN Cecia, PAPADOPOULOS Dimitris, SANDER Pedro, TSOI Yau Chat

Email: kccecia@ust.hk, dipapado@ust.hk, psander@ust.hk, desmond@ust.hk

Course Description

To learn the fundamental concepts and techniques behind object-oriented programming. They include abstract data types; creation, initialization, and destruction of objects; class hierarchies; polymorphism, inheritance, and dynamic binding; generic programming using templates. To learn the object-oriented view of data structures: linked lists, stacks, queues, binary trees, and algorithms such as searching and hashing.

List of Topics

1. Revision of dynamic data structures
2. C++ class basics
3. Separation compilation and makefile
4. Constructors, destructor, initialization
5. Inheritance, polymorphism, and dynamic binding
6. Generic programming
7. Namespace
8. Static member functions/data
9. rvalue reference and move semantics
10. Hashing
11. Binary search trees
12. STL (optional)

Assessments:

Assessment Task	Contribution to Overall Course grade (%)
Laboratory exercises	10%
Programming assignments	24%
Midterm examination	26%
Final examination	40%

Required Texts and Materials

Textbooks

Paul Deitel, Deitel & Associates (2017). **C++ How to Program**.

M.A. Weiss (2014). **Data Structures and Algorithm Analysis in C++**.

Clifford A Shaffer. **Data Structures and Algorithm Analysis** Ed. 3.2 (C++ Version; electronic version: http://people.cs.vt.edu/~shaffer/Book/C++3elatest.pdf.)

Reference books

B. Eckel (2000). **Thinking in C++**.

L. Nyhoff (2005). **ADTs, Data Structures and Problem Solving with C++**.

Stanley Lippman (2013). **C++ Primer**.