

## Liverpool John Moores University

Title: INTRODUCTION TO COMPUTER PROGRAMMING  
Status: Definitive  
Code: **4501YCOM** (115816)  
Version Start Date: 01-08-2012

Owning School/Faculty: Computing and Mathematical Sciences  
Teaching School/Faculty: Kolej Teknologi YPC-ITWEB

Team	Leader
Robert Askwith	Y
Michael Mackay	
Chris Carter	
Faycal Bouhafs	
David Llewellyn-Jones	
Paul Fergus	

**Academic Level:** FHEQ4      **Credit Value:** 24.00      **Total Delivered Hours:** 72.00  
**Total Learning Hours:** 240      **Private Study:** 168

### Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24.000
Practical	24.000
Tutorial	24.000

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Technology	AS1	Series of programming lab tasks	40.0	
Artefacts	AS2	Development of a piece of software	60.0	

### Aims

*To develop IT problem solving skills*

*To become familiar with a range of computer programming techniques*  
*To gain an understanding of how software is developed*  
*To prepare students for software development at higher levels, both work and study*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Apply knowledge of computer programming constructs and algorithms to IT problems
- 2 Demonstrate problem solving skills to create simple software solutions.
- 3 Evaluate alternatives and make sound judgements about data structures
- 4 Investigate development environment tools & libraries for use in software development
- 5 Demonstrate knowledge of the Object-Oriented Programming paradigm

## **Learning Outcomes of Assessments**

The assessment item list is assessed via the learning outcomes listed:

Series of programming tasks	1	2		
Software development	3	4	5	

## **Outline Syllabus**

### *Computers and Computer Programming*

- How programs work within computers*
- Current programming languages and their evolution*
- Programming cycle*
- Interpreted, managed and native code*
- Overview of methodologies: Structured / Imperative, Functional and OO*
- Strong / Weak Typing*

### *IDE*

- Working with code*
- Compiling, profiling, testing and organising code*

### *Basic elements of programs*

- Syntax*
- Variables/Types*
- Expressions*
- Input/Output and Devices*
- Classes and methods*

### *Control structures*

- Conditionals / selection
- Loops / repetition
- Break / return

### Algorithms

- Logical problem solving
- User defined classes/ADTs
- Value and Reference Types
- Arrays / Collections
- String manipulation
- Code structure, procedures/methods, callbacks.
- Recursion

### Libraries and useful library functions

- Standard libraries
- External APIs

### User interfaces

- Events, widgets.
- Graphics: canvases and visual input/output.

### Object-oriented constructs

- Static and Instance Classes
- Encapsulation
- Composition
- Inheritance
- Templates / Generics
- Polymorphism
- Exceptions

## Learning Activities

Lectures – to introduce the programming theories and techniques

Lab exercises – programs for students to write and test

Further exercises – practical examples for students to work on in their own time

Directed reading – background reading to enable the lab work to be completed

## References

<b>Course Material</b>	Book
<b>Author</b>	D. S. Malik
<b>Publishing Year</b>	2012

<b>Title</b>	Java Programming
<b>Subtitle</b>	From Problem Analysis to Program Design
<b>Edition</b>	5th
<b>Publisher</b>	South Western / Cengage
<b>ISBN</b>	9781111577643

<b>Course Material</b>	Book
<b>Author</b>	J. R. Hubbard
<b>Publishing Year</b>	2004
<b>Title</b>	Programming with Java
<b>Subtitle</b>	
<b>Edition</b>	2nd
<b>Publisher</b>	Schaum's Outlines
<b>ISBN</b>	9780071420402

<b>Course Material</b>	Book
<b>Author</b>	D. S. Malik
<b>Publishing Year</b>	2012
<b>Title</b>	C++ Programming
<b>Subtitle</b>	From Problem Analysis to Program Design
<b>Edition</b>	6th
<b>Publisher</b>	South Western / Cengage
<b>ISBN</b>	9781133526346

<b>Course Material</b>	Book
<b>Author</b>	M. Dickheiser
<b>Publishing Year</b>	2012
<b>Title</b>	C++ for Game Programmers
<b>Subtitle</b>	
<b>Edition</b>	2nd
<b>Publisher</b>	Charles River Media
<b>ISBN</b>	1584504528

<b>Course Material</b>	Book
<b>Author</b>	J. R. Hubbard
<b>Publishing Year</b>	2000
<b>Title</b>	Programming with C++
<b>Subtitle</b>	
<b>Edition</b>	2nd
<b>Publisher</b>	Schaum's Outlines
<b>ISBN</b>	9780071353465

<b>Course Material</b>	Book
<b>Author</b>	C. S. Horstmann
<b>Publishing Year</b>	2012
<b>Title</b>	Java for Everyone
<b>Subtitle</b>	Compatible with versions 5,6 and 7

<b>Edition</b>	2nd
<b>Publisher</b>	Wiley
<b>ISBN</b>	9781118063316

---

### **Notes**

This module aims to develop programming and problem solving skills in students to help prepare them for both the further study of software development and for work in an IT environment.