Liverpool John Moores University

Title:	COMPUTER ARCHITECTURE AND OPERATING SYSTEMS
Status:	Definitive
Code:	**4009COMP** (103067)
Version Start Date:	01-08-2011
Owning School/Faculty:	Computing and Mathematical Sciences
Teaching School/Faculty:	Computing and Mathematical Sciences

Team	Leader
Thomas Berry	Y

Academic Level:	FHEQ4	**Credit Value:**	24.00	**Total Delivered Hours:**	74.00
Total Learning Hours:	240	**Private Study:**	166		

Delivery Options
Course typically offered: Semester 2

Component	Contact Hours
Lecture	24.000
Practical	24.000
Tutorial	24.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Students will design and construct a logic circuit to solve a problem.	25.0	
Exam	AS2	Examination	75.0	2.00

Aims

The aim of the module is to enable students to gain a detailed view of computer architecture at the hardware and software levels and basic security concepts.

Learning Outcomes

After completing the module the student should be able to:

1 Manipulate the various numbers bases applicable to computing.
2 State the operation and design of logic gates and analyse their use in synchronous and asynchronous circuits. Use Boolean algebra in representing logic circuits. Manipulating Boolean algebra to simplify circuits.
3 Explain the differences between different memory devices such as RAM and DRAM and the differences between expansion bus architectures. Define the operation of current hard drive and floppy drive mechanisms and their standards and investigate their formats.
4 Identify the different I/O devices and peripherals available and evaluate their use, relative speed and cost.
5 Demonstrate an understanding of the threats and vulnerabilities to information and computer systems. To be able to explain the importance and function of countermeasures such as anti-virus programs, anti-spyware programs and firewalls.
6 Explain how different operating systems work and be able to compare them. This will include process description and scheduling of processes.

Learning Outcomes of Assessments

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

Logic circuit	2					
Exam	1	2	3	4	5	6

Outline Syllabus

Number bases such as binary, hex and octal and how to convert numbers between bases. The methods used to perform mathematical operations within these number bases.
The various levels of abstraction of the Data Hierarchy, i.e. from bit level, through bytes and ASCII.
The use of Boolean algebra to form equations that describe logic circuits and the basic techniques used to manipulate Boolean equations.
Design and Construction of Logic circuits, both synchronous and asynchronous, including encoders, decoders and adders.
A detailed view of memory devices such as: ROM, DRAM, SRAM, etc.
The differences between Expansion bus architectures such as USB, ISA, EISA, MCA, VL, AGP and PCI.
Hard drive standards such as IDE and SCSI.
Peripheral devices used for input and output.
Operating systems.
Introduction to computer security and a review of the common security problems.

Learning Activities

The module consists of 24 lectures, which will cover areas listed under Learning Outcomes. Tutorials will follow lectures with the tutorial activities covering the topic

covered in the preceding lecture. Tutorials will take place in the computing laboratories when appropriate and use appropriate tools and applications.

References

Course Material	Book
Author	Clements, A.
Publishing Year	2006
Title	The principles of Computer Hardware
Subtitle	
Edition	4th Edition
Publisher	Oxford University Press
ISBN	978-0199273133

Course Material	Book
Author	Williams, R.
Publishing Year	2006
Title	Computer Systems Architecture
Subtitle	
Edition	2nd Edition
Publisher	Prentice-Hall
ISBN	9780321340795

Course Material	Book
Author	Tanenbaum, A.S.
Publishing Year	2008
Title	Modern Operating Systems
Subtitle	
Edition	3rd Edition
Publisher	Prentice-Hall
ISBN	9780136006633

Course Material	Book
Author	Pfleeger, C.P. & Pfleeger, S.
Publishing Year	2006
Title	Security in Computing
Subtitle	
Edition	4th Edition
Publisher	Prentice-Hall
ISBN	9780132390774

Notes

This module provides an overview of hardware, software and systems study of

representative modern computer systems. This also includes an introduction to computer security.