Module Information

Module Identifier	**CS10110**
Module Title	**Introduction to Computer Hardware, Operating Systems and Unix Tools**
Academic Year	**2014/2015**
Co-ordinator	**Mr David Ernest Price (mailto:dap@aber.ac.uk?subject=CS10110)**
Semester	**Semester 1**
Pre-Requisite	**Registration in Computer Science Department.**
Other Staff	**Mr David Ernest Price (mailto:dap@aber.ac.uk?subject=CS10110)** **Dr Myra Scott Wilson (mailto:mxw@aber.ac.uk?subject=CS10110)** **Mr Michael Francis Clarke (mailto:mfc1@aber.ac.uk?subject=CS10110)**

Course Delivery

Delivery Type	Delivery length / details
Lecture	22 lectures
Practical	8 x 2hr practicals

Assessment

Assessment Type	Assessment length / details	Proportion
Semester Exam	1.5 Hours on-line exam	70%
Semester Assessment	Up to 8 practical worksheets completed in labs and in own time	30%
Supplementary Exam	1.5 Hours Resit failed examination and/or resubmission of failed/non-submitted coursework components or ones of equivalent value.	100%

Learning Outcomes

On successful completion of this module students should be able to:

be able to describe the major hardware components of a computer system and its peripherals (from chips and logic gates upwards).

be able to demonstrate their understanding of the types of function and facilities provided by Microsoft and Unix operating systems for users and programmers.

be able to demonstrate a practical understanding of the facilities available to script programmers using the UNIX environment, by bringing together various utility programs to solve a problem.

be able to describe fundamental issues, concepts, and challenges associated with operating systems.

Brief description

This module gives students a broader understanding of the infrastructure of a personal computer. It addresses basic issues in hardware and operating systems and focuses on commonly available desktop personal computer systems.

The module is provided as an option for all Computer Science students but is also available as a service course.

Aims

The aim of this module is to widen students exposure to the PC environment. Both Microsoft and UNIX operating systems are environments are widely used in industry to support serious software engineering and the internet. The module will use examples from both Microsoft and Unix based operating systems to illustrate the concepts that it presents. Recent trends mean many students are familiar with Microsoft environments and this module will introduce UNIX as a widely used alternative and compare the facilities of both. The students will gain practical skills associated with using both environments

Content

1. Elements of a personal computer system - 3 Lectures

Fundamental resources of a personal computer system. Architectural Block Diagram. Interaction through the OS and its interface components. Operating-system: definition and trivial examples of functionality. The Onion Skin Model as a simple view. Everything is a program. The idea of a system call, and the idea of the OS providing services.

2 Basic facilities of MS Windows and Unix operating Systems - 1 Practical

Introduction to the user interface facilities of both Microsoft Windows and Linux.

3. User interfaces and the OS - 6 Lectures

GUI'r and command line environments. X-windows and networked environments. UNIX tools: simple pattern matching and use of grep, sed, awk, introduction to BASH scripting.

4. Filestore, process and task management - 2 Practicals

Introduction to the filesystems and process control facilities of both Microsoft Windows and Unix.

5. Major operating system functionality ? files, processes (tasks) and memory management. - 5 Lectures

What files are. Reading and writing of files as services provided by the OS. Permissions and file-protection. The trash-can and file recovery. Physical file storage concepts. What is a process? Relationships of files, programs and processes. The OS and its components as processes. Schedulers and what they allow you to do. Multithreading. Concept of memory contexts and swapping. Difficulties (deadlock concept etc).The idea of interruption. Memory management. Swap-files and using disk as "extra memory". Allocation and deallocation of memory as a service provided by the OS. Fragmentation of memory.

6. UNIX tools and bash scripting and regular expressions - 5 Practicals

Working efficiently: practical use of the facilities Unix to support common application, computing, administration, and maintenance tasks. When to script rather than mouse around.

7. Storage Devices and peripherals - 3 Lectures

Magnetic, Optical, and solid state storage technologies (eg. 'rpod?, DVD and memory sticks). Disks, sectors and tracks. Fragmentation: differences between disk and memory.

8. Introduction to the basic building blocks - 5 lectures.

Binary numbers. Introduction to logic (AND/OR/NOT). Memory. Bus. CPU functions.

9. Learning support - 1 Practical

On-line self multiple choice questionnaire to assist in self assessment and to provide the students with a basis for their personal revision activities.

Reading List

Consult For Futher Information

Irv Englander *Architecture of Computer Hardware and Systems Software: An IT Approach* 2nd Primo search (http://primo.aber.ac.uk/primo_library/libweb/action /search.do?vl%28freeText0%29=Architecture+of+Computer+Hardware+and+Systems+Software%3A+An+IT+Approach+Irv+Englander&fn=search&vid=ABERU_VU1)

L. Long and N Long *Computers* 7th Prentice Hall Primo search (http://primo.aber.ac.uk/primo_library/libweb/action /search.do?vl%28freeText0%29=Computers+L.+Long+and+N+Long&fn=search&vid=ABERU_VU1)

P. Norton *Inside the PC* 7th Prentice Hall Primo search (http://primo.aber.ac.uk/primo_library/libweb/action/search.do?vl%28freeText0%29=Inside+the+PC+P.+Norton&fn=search& vid=ABERU_VU1)

Extensive reference will also be made to World Wide Web resources, the addresses of which will be provided during the course. Primo search (http://primo.aber.ac.uk/primo_library /libweb/action /search.do?vl%28freeText0%29=Extensive+reference+will+also+be+made+to+World+Wide+Web+resources%2C+the+addresses+of+which+will+be+provided+during+the+course.+& fn=search&vid=ABERU_VU1)

Notes

This module is at CQFW (http://wales.gov.uk/topics/educationandskills/qualificationsinwales/creditqualificationsframework/?lang=en) Level 4