

MODULE: SYSTEMS SOFTWARE (course code BSCH-SS)

Griffith College Dublin – Computing Science

Year-long module (Fall & Spring)

This module is open to YEAR ABROAD STUDENTS ONLY. No pre-requisites.

Aims

This module will show you the tangible side of computer science. It provides you an understanding of the fundamental topics in machine code and the infrastructure in which these commands run.

You will see an application of machine code through an introduction to assembly programming (including system calls and interrupt handling). You will also cover different operating system structures, their component features, and how virtual machines of an operating system operate.

Learning Outcomes

Upon successful completion of this module, you should be able to:

1. design and implement simple assembly language programs
2. describe the phases of program translation between source code to executable code
3. analyse different addressing modes
4. discuss the history of programming languages
5. explain the requirements of a multitasking system
6. distinguish between user and system modes; discuss system calls and interrupts
7. identify the concepts behind virtual machines and their benefits
8. install and examine modern operating systems

Indicative Content

Topic	Description
Internal microprocessor architecture	Multipurpose registers, special purpose registers & flags, segment registers. Real mode and protected mode addressing, immediate, direct, indirect & index addressing. Stack addressing.
Introduction to programming languages.	History of programming languages. What is compiling and linking? Interpreter based languages.
Introduction to assembly	Data movement instructions. Program control instructions. Arithmetic in assembly. Logic instructions.

language	
Multitasking Systems	Shared resources, concurrency, deadlock and prevention. Multiprogramming verses multitasking. Scheduling controls.
Modular programming	Assembler and linkers. Creating libraries. Using system calls and interrupts.
Motherboard and chipsets	Form factors. AT, XT, ATX, BTX, ITX. Chipset architectures; North bridge, South bridge.
Introduction into Operating Systems	Overview of operating systems. Multitasking requirements; switching processes and the dispatcher.
Virtual Machine	Virtual processors, disks and machines. Implementation and benefits. JAVA virtual machine
Hardware Practical	Installing operating systems. Examining the terminal and GUI interfaces.

Assessment Methods

Continuous assessment will be based on a combination of some of the following:

- Programming assignments
- Selected homework and worksheets
- Case studies
- Class tests
- Lab practicals.

The continuous assessment work addresses all the learning outcomes. The final examination addresses learning outcomes 1 – 7.