

**Dublin Institute of Technology**

Pre-requisite module code(s)	Co-requisite module code(s)	ECTS credits	Module code	Module title
ELEK1189 ELEK1289		5	MICR2108	Microcomputer Systems 1

**8.9 MICR2108 (Microcomputer Systems 1)****Module author:**

Tom Scarff

**Module Description:**

This module provides the student with detailed knowledge of the structure and operation of microcomputers, and Input/Output interfacing. It also provides the ability to design, assemble, compile and debug microcomputer assembly language programmes.

**Module aim:**

The aim of this module is to provide the students with an understanding of the architecture and organization of basic 8-bit microcomputer systems and the ability to programme these systems

**Learning Outcomes:**

On completion of this module, the student will be able to:

- Describe and explain the operation of 8-bit microcomputers.
- Describe and explain microprocessor internal organization, and Input/Output interfacing.
- Design, assemble and debug Assembly language routines to control and interface microcomputers.

**Learning and Teaching Methods:**

Lectures per week supported by laboratory sessions course of a 12 week semester.

**Module content:**

- Von Neumann architecture of an 8-bit microprocessor, dedicated and general-purpose registers
- The bus-structured computer system: CPU, memory and input/output ports
- Introduction to micro-controller architecture, instruction set, execution and address modes
- Arithmetic Logic Unit (ALU) and Accumulator
- Signed numbers and the jump, branch instructions
- Address decoding
- Low level Assembly language programming
- Address bus decoding
- Interface adapters: General-purpose parallel and serial Input/Output
- Serial communications

**Laboratory Programme:**

- Write assembly language programmes to familiarize the student with a range of instruction types and addressing modes
- Exercises involving the use of an integrated development environment to develop, trace and debug more sophisticated assembly programmes
- Exercises involving the interfacing of input/output adapters
- Simple programmes for adding, comparing, branching etc.
- Programmes for processing data lists
- Programmes to implement software delays

**Module Assessment:**

The assessment comprises two components. The first component is a 2-hour written examination sat at the end of the semester, comprising four questions, attempt three. This accounts for 70% of the overall assessment. The second component is a continuous laboratory assessment, which accounts 30% of the overall assessment.

The overall pass mark is 40%. To achieve a pass result students must achieve at least 35% of the total available marks in the components.

**Essential reading:**

- Wray, Greenfield and Bannatyne, *Using microprocessors and microcomputers, The Motorola Family*. 4<sup>th</sup> ed., Prentice Hall, 1999.

**Supplemental reading:**

- S. Tannenbaum, *Structured Computer Organization*. 4<sup>th</sup> ed., Prentice Hall, 1999.

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**Further Details:**

Learning hours:

The module is delivered over one semester. There are two 1-hour lectures per week and one 2-hour laboratory per week. Students are expected to spend an average of an additional 3.71 hours per week in self-study.

Learning hours are calculated assuming 12 weeks of lectures and laboratory classes within a 14-week semester

Date of Academic Council approval .....