

Module Title:	Computer Architecture for Games Devices
Credits:	10
NFQ Level:	6
Module Delivered In	No Programmes
Teaching & Learning Strategies:	Combination of lecture and laboratory sessions. Lectures will provide traditional theory. Laboratory sessions will employ formative practical/assessment sheets and learning assembly language. Project work will be based on programming in assembly language on an embedded games device
Module Aim:	Introduce the structure, role and function of components that constitute a computer system. Examine the architecture of a computer system including constituent components, buses, memory, CPU, instruction set of a microprocessor and connected peripherals. Introduce assembly language programming on an embedded games device
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Identify the architectural components of a computer, and understand the role of each component and inter-connector
LO2	Understand and differentiate between hardware, software and firmware
LO3	Understand the operation of a microprocessor and develop assembly language programs for embedded games devices
Pre-requisite learning	
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>	
No requirements listed	

Module Content & Assessment

Indicative Content

Hardware

Introduction to Computer Hardware. Structure of a computer: CPU architecture and operation, memory, I/O; ALU, registers, fetch/execute cycle, and buses. I/O devices.

Number Systems and Data Representation

Understanding and using numbers expressed in different bases. Unsigned and signed data types, addition and subtraction, floating-point representation, precision and accuracy and character storage ASCII and Floating Points

Logic

Logic, Logic Gates and Circuits Flip flops, Adders and Decoders Analogue/Digital; Switching elements; Logic gates; Logic circuits, types and examples.

Software Models

Introduction to the layers of software / firmware architecture

Memory

RAM / ROM, Primary memory: organisation and operation; cache. Computer memory: Types, costs, organization and operation, speed. Data storage devices

Assembly Language

Introduction to 68000 and 8-bit Atmel Micro-controller ATmega644 processors and instruction sets. Machine language, displaying and modifying of register and memory contents. Instruction sets: characteristics and function, modes and formats, data types, addressing, flow of control.

Assessment Breakdown	%
Continuous Assessment	10.00%
Project	20.00%
Practical	10.00%
End of Module Formal Examination	60.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	Quiz and case study	1,2	10.00	Every Week

Project

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Assembly Programming	3	20.00	Week 22

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Laboratory based practicals	1,2	10.00	Every Second Week

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	No Description	1,2,3	60.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	30 Weeks per Stage	1.50
Laboratory	30 Weeks per Stage	1.00
Estimated Learner Hours	30 Weeks per Stage	2.00
Total Hours		135.00

