Module Title:	Advanced Programming
Language of Instruction:	English

Credits:	10

NFQ Level:	7

Module Delivered In	No Programmes

Teaching & Learning Strategies:	Lectures, Laboratories, Programming Assignments, Continuous Assessment and Final Examination

Module Aim:	To give students a thorough understanding and practical experience of programming with C, and to introduce OOP and GUI programming with C++ and C#.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Be familiar with correct program structure and good programming practice
LO2	Have an understanding of C/C++ necessary to design and implement a given application
LO3	Be able to identify time critical or hardware critical code components.

Pre-requisite learning	
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*	
No recommendations listed	
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*	
No requirements listed	

Module Content & Assessment

Indicative Content
Application types Development details of multiple source file programs using external object files, libraries, components, etc.; Debugging; Testing; Programming paradigms;
C programming Introduction; Data types; Enumerations; Symbolic constants; Operators; Expression evaluation - precedence & associativity;.
Flow control Program structure; Programming standards
Functions Parameter passing; Recursion; Stack issues; Scope; Static functions. Functions with variable sized parameter lists.
Arrays Contiguousness; Arrays as function parameters; Strings; Initialisation.
Pointers Pointer arithmetic; Pointers on PC
Pointers and arrays Arrays of pointers; Character arrays vs. string constants; Pointers to functions; Dynamic memory; Stack & Heap;
Complex declarations n/a
Preprocessor n/a
Structures Unions,bit fields, Typedef
I/O & file handling; Scripting; I/O & file handling; Scripting;
C++ Building on C; OOP; Classes, objects, constructors and destructors; Data hiding; Encapsulation; Inheritance; Polymorphism; Operator and function overloading; Other C++ enhancements; GUI & systems programming

Assessment Breakdown	%
Continuous Assessment	25.00%
Practical	25.00%
End of Module Formal Examination	50.00%

Continuous Assessment				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Other	Continuous assessments to test knowledge and application of lecture material	1,3	25.00	n/a

No Project

Practical				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Practical assignments to apply learned knowledge and develop problem solving skills	1,2	25.00	Sem 1 End

End of Module Formal Examination				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	No Description	1,2,3	50.00	End-of-Semester

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

Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	20 Weeks per Stage	2.00
Laboratory	20 Weeks per Stage	4.00
Estimated Learner Hours	20 Weeks per Stage	2.50
	Total Hours	170.00