Module Title:	Introduction to Computer Programming
Language of Instruction:	English

Credits:	5

NFQ Level:	6

Module Delivered In	No Programmes

Teaching & Learning Strategies:	The module will be delivered with a blend of lectures and problem based learning for tutorial and practical classes.

Module Aim:	To introduce students to the fundamentals of software development using a high level programming language and to equip them with the skills and techniques required to develop software using an industry standard integrated development environment (IDE) to solve engineering based problems. To provide students with a foundation for subsequent modules in the area of computer programming and programmable electronics / embedded systems.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Demonstrate an understanding of the fundamentals of software development and the building blocks of a high level programming language, e.g. data types, decisions, looping, arrays, functions, etc.
LO2	Understand the importance of modular programming, flowcharts and pseudocode as software development techniques, and employ these techniques during software development.
LO3	Develop algorithms to solve basic engineering based problems and use flowcharts to represent these algorithms.
LO4	Develop and debug source code using a contemporary integrated development environment (IDE) to solve basic engineering based problems.
LO5	Produce clearly documented source code using a neat programming style.

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
Introduction to Computer Programming High level programming languages, compilers, linkers, integrated design environments (IDEs), etc.
Fundamentals of Software Development Top down design, modular design, algorithms, flowcharts, pseudocode, etc.
Variables, Constants, Data Types, Operators and Expressions Variables, variable scope, constants, data types, type casting, arithmetic operators, bitwise operators, relational operators, ternary operator, arithmetic expressions, boolean expressions, etc.
Making Decisions If statement, if / else statement, switch / case statement, etc.
Program Looping While loops, do while loops, for loops, nested loops, infinite loop, etc.
Arrays One dimensional arrays, multi-dimensional arrays, indexing, array calculations, etc.
Functions In-built functions, user defined functions, declaration, definition and invocation, function prototypes, passing variables to / from functions, call by value, call by reference, recursion, etc.

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

Continuous Assessment				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Examination	Students will sit written and / or practical examinations during the module.	1,2,3,4,5	20.00	Week 8

No Project

Practical				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Students will complete laboratory assignments and mini projects which will be completed over several weeks.	1,2,3,4,5	20.00	Every Week

End of Module Formal Examination				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Final practical exam.	1,2,3,4,5	60.00	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	Every Week	0.50
Practicals	Every Week	1.00
Independent Learning	Every Week	2.00
	Total Hours	3.50