Module Title:	Computer Programming for Engineers
Language of Instruction:	English

Credits:	10

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 further develop students programming skills. To introduce students to the fundamentals of object oriented software development using a high level programming language and to equip them with the skills and techniques required to develop object oriented 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 object oriented computer programming and programmable electronics / embedded systems. To provide students with the skills and techniques required to analyze, simulate and solve engineering based problems using an industry standard matrix based numerical analysis package.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Competently use interactive matrix based numerical analysis packages to analyse, simulate and solve engineering based problems.
LO2	Demonstrate an understanding of the fundamentals of object oriented software development and the building blocks of a high level object oriented programming language.
LO3	Develop and debug clearly documented source code using a neat programming style and a contemporary integrated development environment (IDE) to solve engineering based problems.
LO4	Competently use a distributed revision control and source code management system.

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
Object Oriented Programming Review of the fundamentals computer programming, structures, strings, pointers, the pre-processor, input and output operations, enumerated data type, type definitions, object oriented programming, introduction to the unified modelling language (UML).
Revision Control Distributed revision control, source code management.
Numerical Computation Matrix based numerical computation environment (e.g. MATLAB), algorithms, flowcharts, pseudocode, modular program design, built-in functions, plotting data, user controlled input and output, logical functions and control structures, user defined functions, graphical modelling of a system (e.g. Simulink).

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	20.00	Sem 1 End

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	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	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 Second Week	0.50
Practicals	Every Week	2.00
Independent Learning	Every Week	2.00
	Total Hours	5.00