

<b>Module Title:</b>	Robotics Programming 2
<b>Language of Instruction:</b>	English
<b>Credits:</b>	10
<b>NFQ Level:</b>	6
<b>Module Delivered In</b>	<a href="#">2 programme(s)</a>
<b>Teaching &amp; Learning Strategies:</b>	A combination of lectures, class discussions, tutorials, laboratory exercises and demonstrations will be used. Emphasis will be placed on active learning including problem / project-based learning.
<b>Module Aim:</b>	To advance the students' knowledge in software development using a high-level programming language; to equip students with the skills and techniques required to develop software using an industry standard integrated development environment (IDE).

Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Demonstrate an understanding of software and algorithm development and the building blocks of a high-level programming language.
LO2	Utilise modular programming, flowcharts, pseudocode and debugging techniques in software development.
LO3	Define and use a variety of data types and structures in an appropriate context.
LO4	Produce clearly documented source code using a neat programming style.
LO5	Use a distributed revision control and source code management system.
LO6	Combine programming constructs to implement problem-solving algorithms, compare good and bad implementations and algorithms.
LO7	Work as an individual or in a small group to design and implement a software solution for a real world problem using a basic textual description of the problem.

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

**Data Types**

Data types, arrays, strings, pointers, structures, typecasting

**Making Decisions and Iterations**

Conditional statements, ternary operator, loops, nesting

**Functions**

User-defined functions, passing by value and by reference, recursion

**Algorithms**

Algorithm implementation (sorting, search, numerical methods)

**Software Development, Testing and Debugging**

Use a professional Integrated Development Environment (IDE) and debug code (breakpoints, single step), develop algorithms

**Assessment Breakdown**

	%
Project	40.00%
Practical	20.00%
End of Module Formal Examination	40.00%

No Continuous Assessment

**Project**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	A problem-based learning project based on real world scenarios.	1,2,3,4,5,7	40.00	n/a

**Practical**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Practical assessments to complement the laboratory exercises.	1,2,3,4,5,6,7	20.00	n/a

**End of Module Formal Examination**

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	A final theory and practical exam to assess the students' learning.	1,2,3,4,5,6	40.00	End-of-Semester

**ITCarlow reserves the right to alter the nature and timings of assessment**

**Module Workload**

<b>Workload: Full Time</b>		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Every Week	3.00
Laboratory	Every Week	4.00
Independent Learning Time	Every Week	11.00
Total Hours		18.00

**Module Delivered In**

Programme Code	Programme	Semester	Delivery
CW_EERAS_B	<a href="#">Bachelor of Engineering (Honours) in Robotics and Automated Systems</a>	3	Mandatory
CW_EERAS_D	<a href="#">Bachelor of Engineering in Robotics and Automated Systems</a>	3	Mandatory