

Module Title:	Industrial Automation and Robotics
Language of Instruction:	English
Credits:	5
NFQ Level:	6
Module Delivered In	2 programme(s)
Teaching & Learning Strategies:	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.
Module Aim:	To provide students with a high-level overview of industrial automation and robotic systems.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Understand the fundamental principles of industrial automation.
LO2	Describe various robot types, components, and typical applications
LO3	Explain the design and operation of components and subsystems that comprise robotic and automated systems.
LO4	Understand how sensors, hardware, and software are used in combination to control robotic and automated systems.
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

Introduction to industrial automation

Definition and purpose of industrial automation. History and trends of industrial automation. Architecture of Industrial Automation Systems. Common components in industrial systems

Introduction to Robotics

Industrial Robot Definition, History and Evolution. Industrial robot type and application. Robot design philosophy. Robot configuration and coordination. Robot parameters (payload, work envelop, etc)

Components of Robotic Systems

Mechanical body parts and axis or freedom of rotation. Robot end-effectors (grippers, tooling, etc). Robot Sensors (Ultrasonic, photoelectric, Vision, Pressure). Actuators (Servomotor, valves, solenoids)

Introduction to control

Definition and use of control in automated systems. Type of industrial controllers. Open and closed loop control system. Reading data from sensors.

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	A mixture of theory and/or practical assessments to reinforce learning throughout the semester.	1,2,3	20.00	n/a

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	A series of assignments and practical tasks to complement the theory elements of the module.	4	20.00	n/a

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Final Examination	1,2,3,4	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	Every Week	3.00
Laboratory	Every Week	2.00
Independent Learning Time	Every Week	1.00
Total Hours		6.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EEROB_B	Bachelor of Engineering (Honours) in Robotics and Automated Systems	3	Mandatory
CW_EEROO_D	Bachelor of Engineering in Robotics and Automated Systems	3	Mandatory