Institiúid Teicneolaíochta Chorcaí
Cork Institute of Technology

DRAFT

Certificate in Industrial Automation and Networks

Awards
Certificate

Programme Code:		**Mode of Delivery:**	Part Time, Partially Online	**No. of Semesters:**	2
NFQ Level:	8				
Embedded Award:	No	**Programme Credits:**	10		
Valid From:	Semester 1 - 2022/23 (September 2022)				
Next Review Date:	May 2025				
Department:	MECHANICAL, BIOMEDICAL & MANUFACTURING ENGINEERING				
Programme Sponsor:	NIALL MORRIS				
Educational Aim of Programme:	The Certificate in Industrial Automation and Networks aims to provide the learner with advanced knowledge of PLC programming using multi languages and the ability to develop PLC communication across the required network structures.				

Programme Outcomes

Upon successful completion of this programme the graduate will be able to demonstrate... :

PO1	Knowledge - Breadth	
	(a)	Detailed knowledge and understanding of the essential facts, major concepts, principles and theories associated with PLC, HMI and Networking in modern automation systems.
PO3	Skill - Range	
	(a)	The ability to evaluate the five IEC61131-3 PLC Programming Languages and the appropriate network communication protocols
PO5	Competence - Context	
	(a)	Connect the correct Input/Outputs to the PLC, HMI and map the IO bits to the programming charts.
PO6	Competence - Role	
	(a)	Programme a PLC incorporating a HMI using the appropriate languages communicating across the selected network.

Semester Schedules

Stage 1 / Semester 1

Mandatory								
Mod Code	**Module Title**	**Co-ordinator**	**Level**	**Credits**	**FT Contact Hours**	**PT Contact Hours**	**Course Work**	**Formal Exam**
COMP6029	Network Systems (Approved)	Sean McSweeney	Fundamental	5.0	4.00	4.00	100.0	0.0

Stage 1 / Semester 2

Mandatory								
Mod Code	**Module Title**	**Co-ordinator**	**Level**	**Credits**	**FT Contact Hours**	**PT Contact Hours**	**Course Work**	**Formal Exam**
No Code Yet	Digitalised Automation Systems (Draft)	NIALL MORRIS	Advanced	10.0	3.00	3.00	100.0	0.0

PO Delivery Using DETAILED Mappings

Programme Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
M/E	Supporting Modules								
M	**COMP6029: Network Systems**	6		6		2	2		
M	**Digitalised Automation Systems**	5		5		5	5		

PO1.: Knowledge - Breadth
(a) Detailed knowledge and understanding of the essential facts, major concepts, principles and theories associated with PLC, HMI and Networking in modern automation systems.

Supporting Modules	
COMP6029 - Network Systems	• LO 1: Describe the Open System Interconnection (OSI) reference model and the communication process between different layers. • LO 2: Discuss Ethernet LAN technologies. • LO 3: Analyze the operations and features of the network layer protocols and services. • LO 4: Apply IP subnetting by calculating subnet masks and addresses to fulfill given requirements. • LO 5: Configure & troubleshoot routing protocols on industry standard routers. • LO 6: Identify the characteristics of distance vector routing protocols.
Digitalised Automation Systems	• LO 1: Analyze controllers and PLC programming languages to suit industry requirements. • LO 2: Programme PLC's using multi languages with IEC61131-3 standards • LO 3: Incorporate and programme a HMI through an industrial network. • LO 4: Install and programme industrial sensors, RFID tags and vision systems • LO 5: Create a Digital Twin environment for an automation system.

PO3.: Skill - Range
(a) The ability to evaluate the five IEC61131-3 PLC Programming Languages and the appropriate network communication protocols

Supporting Modules	
COMP6029 - Network Systems	• LO 1: Describe the Open System Interconnection (OSI) reference model and the communication process between different layers. • LO 2: Discuss Ethernet LAN technologies. • LO 3: Analyze the operations and features of the network layer protocols and services. • LO 4: Apply IP subnetting by calculating subnet masks and addresses to fulfill given requirements. • LO 5: Configure & troubleshoot routing protocols on industry standard routers. • LO 6: Identify the characteristics of distance vector routing protocols.
Digitalised Automation Systems	• LO 1: Analyze controllers and PLC programming languages to suit industry requirements. • LO 2: Programme PLC's using multi languages with IEC61131-3 standards • LO 3: Incorporate and programme a HMI through an industrial network. • LO 4: Install and programme industrial sensors, RFID tags and vision systems • LO 5: Create a Digital Twin environment for an automation system.

PO5.: Competence - Context
(a) Connect the correct Input/Outputs to the PLC, HMI and map the IO bits to the programming charts.

Supporting Modules	
COMP6029 - Network Systems	• LO 4: Apply IP subnetting by calculating subnet masks and addresses to fulfill given requirements. • LO 5: Configure & troubleshoot routing protocols on industry standard routers.
Digitalised Automation Systems	• LO 1: Analyze controllers and PLC programming languages to suit industry requirements. • LO 2: Programme PLC's using multi languages with IEC61131-3 standards • LO 3: Incorporate and programme a HMI through an industrial network. • LO 4: Install and programme industrial sensors, RFID tags and vision systems • LO 5: Create a Digital Twin environment for an automation system.

PO6.: Competence - Role
(a) Programme a PLC incorporating a HMI using the appropriate languages communicating across the selected network.

Supporting Modules	
COMP6029 - Network Systems	• LO 4: Apply IP subnetting by calculating subnet masks and addresses to fulfill given requirements. • LO 5: Configure & troubleshoot routing protocols on industry standard routers.
Digitalised Automation Systems	• LO 1: Analyze controllers and PLC programming languages to suit industry requirements. • LO 2: Programme PLC's using multi languages with IEC61131-3 standards • LO 3: Incorporate and programme a HMI through an industrial network. • LO 4: Install and programme industrial sensors, RFID tags and vision systems • LO 5: Create a Digital Twin environment for an automation system.