ELEC H3501: PLCs and Electropneumatics

Module Title:	PLCs and Electropneumatics
Language of Instruction:	English

Credits:	5

NFQ Level:	8

Module Delivered In	1 programme(s)

Teaching & Learning Strategies:	The lectures will incorporate a mixture of presentations, examples and student exercises/problem-solving, question and answer sessions, group discussions and online resources. The Institute Managed Virtual Learning Environment will be utalised in the module delivery to provide learning resources and interactively communicate with students. Extensive use will be made of “hands-on” laboratory equipment, PLC software simulation programs and Electropneumatic software simulation programs to promote greater student engagement with the learning process by facilitating them to apply and implement the concepts explored in the classroom. Students will also work collaboratively from time to time in the completion of exercises and development of solutions.

Module Aim:	The aim of this module is to develop the students understanding of Programmable Logic Controllers and Electro-Pneumatic control systems as applied to systems used in automated processes across a range of industrial applications both safely and ethically.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Explain the operating principles of PLC's and Electropneumatic Control Systems.
LO2	Develop a PLC Program for a given application.
LO3	Specify suitable electropneumatic valves, sensors and actuators to interface with a PLC program.
LO4	Implement programming and debugging procedures for different PLCs.

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

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Module Content & Assessment

Indicative Content
PLC Overview Construction of PLCs including Rack and Modular types, types of input/output modules and their applications, internal PLC memory types. Ethical consideration when operating and programming PLC's
PLC Operation Introduction to the operation of PLC's including programming methods, Internal relays, Timers and Counters and safety precautions when wiring PLC's.
Electropneumatics Operation of electropneumatic components, including solenoid operated valves, actuators and position detection switches. Safety considerations when working with pneumatic equipment.
PLC Programming Generate a PLC program for a given operation including Input/Output schedules, wiring diagrams, programming, fail safe operations, correct shut down of machinery and testing individually and collaboratively..
HMI Introduction to HMI programming to interface with a between the PLC and the operator.

Assessment Breakdown	%
Continuous Assessment	50.00%
End of Module Formal Examination	50.00%

Continuous Assessment				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Short Answer Questions	Online/Classroom based test.	1,3	5.00	Week 5
Short Answer Questions	Online/Classroom based test.	1,3	5.00	Week 10
Project	Create a project to demonstrate the control of an application using a PLC.	1,2,3,4	40.00	Sem 1 End

No Project

No Practical

End of Module Formal Examination				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	Written Exam	1,2,3	50.00	End-of-Semester

Continuous Assessment				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Short Answer Questions	Online/Classroom based test.	1,3	5.00	Week 5
Short Answer Questions	Online/Classroom based test.	1,3	5.00	Week 10
Project	Create a project to demonstrate the control of an application using a PLC.	1,2,3,4	40.00	Sem 1 End

No Project

No Practical

End of Module Formal Examination				
Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	Written Exam	1,2,3	50.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lab/Lecture	Every Week	3.00
Independent Learning Time	Every Week	6.00
	Total Hours	9.00

Workload: Part Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lab/Lecture	Every Week	3.00
Independent Learning Time	Every Week	6.00
	Total Hours	9.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EMIMC_D	Batchelor of Science in Industrial Measurement and Control	1	Mandatory