GMIT
INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO
GALWAY-MAYO INSTITUTE OF TECHNOLOGY

ENGI07011
Industrial Automation 2

Full Title	Industrial Automation 2		
Status	Uploaded to Banner	**Start Term**	2009
NFQ Level	07	**ECTS Credits**	10
Module Code	ENGI07011	**Duration**	Stage - (26 Weeks)
Grading Mode		**Department**	Electronic & Electrical Eng
Module Author	Ray Weldon		

Module Description

This module will provide the student with practical knowledge of Electrical and Mechanical Automated systems including Plant Control Circuitry/Hybrid Design, PLC/HMI Programming etc.

	Learning Outcomes ***On completion of this module the learner will/should be able to:***
1.	Configure PLC hardware including I/O devices Analogue and Digital .
2.	Write program blocks for Programmable Controllers using a variety of programming languages.
3.	Explain the operation and utilisation of various sensors and actuators for automated systems for the purpose of data acquisition.
4.	Develop and test control solutions for automated systems, both electronic and pneumatic.
5.	Demonstrate an awareness of and be able to implement safety measures in the design of automated systems.

Indicative Syllabus

Programmable logic Control/Human machine Interfacing/ including various programming languages e.g. Ladder/Instruction List/Sequential flow chart.

Control system principles

Safety in automated systems. Health and Safety Directives.

PLC hardware/selection and configuration of; power supply modules, CPU, digital input/output modules..

Principle of operation of transducers/sensors and actuators, Plant control circuitry/Hybrid design. Data acquisition. Simulation control will also achieved using Automation suite/LabView.

Pneumatics/Compressors/Valve actuators

Case studies/Control Building Blocks.

Fault finding and Diagnostics.

Laboratory Exercises:- These will include:

Introductory Applications e.g Timers, retentive Timers, Counters, Cascading Counters.

Programming Techniques e.g. MCR, JUMP and Force Control.

Sequencers. Interlocking both 'Hard Wired and Using Monitoring Contacts. Sequential Function Chart (SFC), Function Block Diagram (FBD).

Practical Projects e.g. Safety Relays, Control Relays, Power Switching, Explosive Atmospheres, Spray Painting, Saw Bench Cutting, Faulty Batch Detector, Car Park project including Pneumatic Control System.

Teaching and Learning Strategy

Assessment Strategy

Repeat Assessment Strategies

Indicative Coursework and Continuous Assessment:		50 %		
Form	***Title***	***Percent***	***Week (Indicative)***	***Learning Outcomes***
UNKNOWN	Class Assessment	50 %	OnGoing	1,2,3,4,5

End of Semester / Year Formal Exam:		50 %		
Form	***Title***	***Percent***	***Week (Indicative)***	***Learning Outcomes***
UNKNOWN	Final Exam	50 %	UNKNOWN	1,2,3,4,5

Full Time Delivery Mode Average Weekly Workload:			5.00 Hours		
Type	***Description***	***Location***	***Hours***	***Frequency***	***Weekly Avg***
Lecture	Lecture	Flat Classroom	2	Weekly	2.00
Practical	Lab Work	Engineering Laboratory	3	Weekly	3.00

Literary Resources

Ridley, John (2010) *Programmable Logic Controllers (Application and Programming)* Amsterdam, Newnes.

Zhang, Peng. (2008) *Industrial Control Technology: A Handbook for Engineers and Researchers,* New York, Williams Andrew.

Collins, D. and Lane, E. (1997) *Programmable Controllers (A Practical Guide)* London, McGraw-Hill.

Hughes, Austin. (2009) *Electric Motors and Drives (Fundamentals, Types and Applications)* Oxford UK, Newnes,

Stacey, Chris. (2008) *Practical Pneumatics* Oxford UK, Butterworth-Heinemann,

Other Resources
None

Additional Information
None

Programme Membership
GA_EINAG_S07 201200 Certificate in Industrial Automation