

Module Title:	Mechatronics 3
Language of Instruction:	English
Credits:	10
NFQ Level:	7
Module Delivered In	No Programmes
Teaching & Learning Strategies:	Module will be delivered through lectures, tutorials, and practical sessions.
Module Aim:	The aim of this module is to provide the students with the ability to apply control techniques to electromechanical processes and construct PLC programs
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Program PLC's using all 3 methods namely Statement List, Ladder Logic and Sequential Function Charts, to control various Mechanical Machines and processes (software simulations)
LO2	Describe various hardware components in modern control systems, illustrating their correct use, and configuration
LO3	Understand the importance of energy conservation and management in an industrial application, under headings of compressed air, motive power, and lighting.
LO4	Interpret electrical billing and metering. Appraise electrical bills and make recommendations in areas such as Power Factor correction, M.I.C. Max Demand.
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
PLC programming

Method of programming from hand held units to computer interface. Structure programs using Ladder Logic, Statement List and Grafset, writing programs to control machine functions using these methods. Write programs to control given sequences on simulation panel. Develop programs to control various machines, carrying out maths functions within PLC's, Data manipulation functions (mask/move) combined with advanced functions (sequential load/output function blocks) Interpret given programs and resolve hidden problems.

Process Control

Creating I/O schedules, Fault diagnostics, recognizing different hardware configurations (sinking/sourcing). Analogue and digital configurations, scaling of inputs and data conversion.

Energy Efficient Technologies in Industry

Compressed Air cost as the 4th utility Energy saving in compressed air Motive power and energy saving opportunities in motive power Lighting controls and energy saving opportunities in lighting

Electrical Billing/Metering

o Domestic / commercial electrical tariffs MIC kWh units day/night kVAr units Max demand

Assessment Breakdown	%
Continuous Assessment	60.00%
Practical	40.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Multiple Choice Questions	Written class tests and or online assessment may be employed to encourage individual learning	1,2	10.00	n/a
Practical/Skills Evaluation	Labs on various simulations of real world plant and equipment	1	10.00	Every Second Week
Examination	Written class assessment	2,3,4	10.00	Sem 2 End
Practical/Skills Evaluation	• Typical Practical laboratory exercises include: • Programming panel installed PLC's (Siemens, Mitsubishi, AB) using interface software to perform a series of functional controls, such as timer, counter functions, linked to external plant and equipment, simulations.	1	30.00	n/a

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Final practical examination will assess the extent to which the student has achieved the module learning outcomes in PLC programming	1	40.00	Sem 2 End

No End of Module Formal Examination

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

Module Workload

Workload: Full Time		
Workload Type	Frequency	Average Weekly Learner Workload
Lecture	Every Week	3.00
Laboratory	Every Week	1.00
Estimated Learner Hours	Every Week	3.00
Total Hours		7.00

