AUTO H2003: Mechatronics 3

Module Title:	Mechatronics 3
Language of Instruction:	English

Credits:	5

NFQ Level:	8

Module Delivered In	2 programme(s)

Module Aim:	The aim of this module is to provide the students with the knowledge to design, build and analyse compressed air, hydraulic and electromechanical systems typically used in industry.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Design a Compressed air system for a factory
LO2	Describe Safe System of Work Plan (S.S.W.P.) for Lock-out Tag-Out in industrial applications.
LO3	Construct electro pneumatic circuits based on standard industrial control circuits. (Ex Hand/Auto cycles, indirect switching of contactors with interlock, hold on contacts) Using training panels and electrical drawings.
LO4	Conduct 3 phase motor test, with appropriate equipment, and assess results.

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

AUTO H2003: Mechatronics 3

Module Content & Assessment

Indicative Content
Design Compressed Air System Calculate Air requirements Design ring and branch mains Layout plant room and considerations for maintenance, expansion and operation. Calculate pressure drops around the mains Drawings of plant room, ring main and typical details. Safety - risk assessment on start-up of compressed air plant and equipment.
Electrical & Electro-pneumatic control Circuits Indirect control of basic electro-pneumatic circuits Correct use of contactors/relay timers and proximity switches. Terminal labelling, standard notation. Design and representation of electrical control circuits for the control of basic electro pneumatic/hydraulic systems. Application of cascade circuits in packaging / handling equipment and analysis of typical pick and place control circuits used in industry. Recognising base positioning and start up conditions, emergency stop implications. Application of solenoid valves and proportional control valves, trouble shooting on circuits and logical steps in analysing problems on electro pneumatic/hydraulic circuits.
Safety & Isolation Procedures Plant Isolation and safety protocols Lock-Out Tag-Out Risk assessment in maintenance and importance of procedures in isolation
AC Motors Installation of Direct-on-Line circuits, Direct on line with remote start/stops. Emergency stops. Sequential control circuits, Hand-off-Auto control circuits. Insulation & continuity testing of motors. Programming and running motor from VSD.

Assessment Breakdown	%
Project	35.00%
Practical	25.00%
End of Module Formal Examination	40.00%

No Continuous Assessment

Project

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Project	Compressed Air project for a factory, calc's pressure drops, specification, and drawings	1	35.00	Sem 1 End

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Combination of Labs & Online assessments	2,3,4	25.00	Every Week

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	Questions on the LO's 1, 2 & 4	1,2,4	40.00	End-of-Semester

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

AUTO H2003: Mechatronics 3

Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	12 Weeks per Stage	3.00
Laboratory	12 Weeks per Stage	2.00
Independent Learning	15 Weeks per Stage	4.33
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EMMEC_B	Bachelor of Engineering (Honours) in Mechanical Engineering	3	Mandatory
CW_EEMEC_D	Bachelor of Engineering in Mechanical Engineering	3	Mandatory