

Module Title:	Mechatronics 2
Language of Instruction:	English
Credits:	5
NFQ Level:	6
Module Delivered In	2 programme(s)
Module Aim:	To introduce the students to the basic principles of automation. To introduce students to the basic principles of electrical science theory and electrical circuits.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Describe the operation of modern S.I. and C.I. Engines and the use of VVT (Variable Valve Timing), recognize modern transmission system, and identify various standard components.
LO2	Describe the principle operation of hydraulic pumps and valves and construct simple hydraulic circuits.
LO3	Recognise standard safety protocols in construction of pneumatic, hydraulic, and electrical systems, namely failsafe design, pressure relief and isolation procedures
LO4	Complete laboratory experiments using appropriate apparatus and test equipment; report on the findings.
LO5	Recognise when to use indirect switching, contactors, relays in electrical control circuits and identify standard components on electrical drawings and wiring diagrams
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
Valves/Pumps/Bearings Types of valves/pumps and bearings Applications of specific valves/pumps and bearings Maintenance of valves/pumps and bearings
Engine Technology Two stroke and four stroke engines Braking / Clutch transmission systems Electrical systems, starter motor, alternator, battery, ECU and load mapping. VVT variable valve timing, cam phasing and cam changing and its effects on performance. Catalytic Converters
Hydraulics Pumps and valves Circuits Safety in operation and design Filtration
Basic Electrical Control Indirect switching using contactors, standard interlocks, emergency stop circuits, electrical wiring diagrams, c/w labs in control circuits for electro-pneumatic machines

Assessment Breakdown	%
Project	10.00%
Practical	30.00%
End of Module Formal Examination	60.00%

No Continuous Assessment

Project				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Project	Engine based project covering aspects of design, control, emissions abatement (EGR, DPF) torquing sequences for components...etc	1	10.00	Week 8

Practical				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Lab based practicals covering battery testing, compression test, hydraulic circuits, electrical circuits, construction of circuits on simulation software...	1,2,3,4,5	30.00	Every Second Week

End of Module Formal Examination				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	Questions on LO's 1,2,3,5	1,2,3,5	60.00	End-of-Semester

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

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	12 Weeks per Stage	3.00
Laboratory	12 Weeks per Stage	2.00
Independent Learning	12 Weeks per Stage	5.42
Total Hours		125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EMMEC_B	Bachelor of Engineering (Honours) in Mechanical Engineering	2	Mandatory
CW_EEMEC_D	Bachelor of Engineering in Mechanical Engineering	2	Mandatory