

Module Title:	Mechanical Workshop
Language of Instruction:	English
Credits:	10
NFQ Level:	6
Module Delivered In	No Programmes
Teaching & Learning Strategies:	Lectures, demonstrations, research, project work and some study will be used to ensure the student has a wide range of experiences.
Module Aim:	To introduce students to the basic principles of • Good workshop practices • Manufacturing technology.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Describe the correct safety procedures in accordance with the latest Health and Safety Act.
LO2	Describe the correct procedures for the use of measuring instrumentation, preparation and marking out raw materials, use of hand tools and fabrication of engineering components.
LO3	Identify the fundamental principles of metal removal, describe cutter tool nomenclature and perform basic engineering calculations leading to metal removal.
LO4	Select appropriate materials for various industrial applications and engineering components.
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

Safety

o Identification of hazards and dangers in the workshop environment. o Health and safety at work. o Current Health and Safety Act. o Employer and employee responsibilities. o Machine guarding. o Manual lifting techniques. o Equipment for lifting heavy loads. o Fire drills and precautions. o Fire regulations. o Extinguishers types and operation.

Heat Treatment of Mild Steels

o Properties of medium to high carbon steels. o Heat treatment of medium to high carbon steel.

Use of hand tools

o Scribe, square, ruler, jennies, callipers, thread gauge, feeler gauge, radius gauge, files, punches, hammer, hacksaw, chisel,

Metrology

o Gauging and measuring. o Use of Vernier callipers, micrometers, height gauges, depth gauges, dial test indicators. o Use and care of slip gauges, sine bar, angular slip gauges, Vernier callipers, precision balls and rollers.

Fabrication and assembly

o Design of components. o Interpretation of drawings. o Joining methods. o Permanent joints e.g. riveting, soldering, brazing, silver soldering, gas welding, manual metal arc welding, adhesive bonding. o Semi-permanent joints e.g. locking devices, screwed fastenings, keys, dowels and circlips

Computer numerical control

o Applications, advantages and limitations. o Control systems, data input, part programming, tool offsets and cutter compensation.

Machine tools and accessories

o Introduction and safe operation of drilling machines, centre lathes, and milling machines. o Practical demonstration of CNC machines. o Practical demonstration of surface, cylindrical and off-hand grinding machines. o Component indexing using the dividing head for Gear and Spline Cutting

Forming Processes

o Sand, die and investment casting. o Cold rolling and wire drawing. o Hot rolling, forging, extrusion and upsetting. o Injection and compression moulding. o Polymer materials and behaviour of same

Assessment Breakdown	%
Continuous Assessment	40.00%
Practical	60.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	• Carry out an inspection of an engineering facility and write a report on safety. • A number of written examinations will assess the extent to which the student has achieved the module learning outcomes. • MCQs.	1,2,3,4	40.00	Every Second Week

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	• Sketch free-hand a number of hand tools. • Use balls and rollers and the appropriate measuring tools to calculate various dimensions of machined components. • Carry out a project on each of the following: • Lathe work, drilling, tapping and screwing, heat treatment, casting, soldering, brazing, welding, forging, gear cutting, fabrication, milling exercise. • Strip down a small component and describe how it works. • End of term practical exam - Christmas & Summer	1,2,3,4	60.00	Every Second Week

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		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Every Week	1.00
Laboratory	Every Week	3.00
Estimated Learner Hours	Every Week	2.50
Tutorial	Every Week	1.00
Total Hours		7.50

