

EN6990

Engineering Practice



Course Aim This course aims to provide students with a range of practical skills and an understanding of engineering principles required to machine or fabricate engineering components. Exposure to these workshop skills will give the student an understanding and an underpinning knowledge on which to base future engineering design considerations or decisions.

Short Title

Faculty EDICT

Polytechnic Level

Credits 15

Pre-requisites None

Co-requisites None

Anti-requisites None

Version 5

Effective From September 1, 2016

Indicative NQF Level 6

Student Contact hrs 90

Self-directed hrs 60

Other directed hrs 0

Total learning hrs 150

Learning Outcomes On successful completion of this course, students will be able to:

- 1 Apply workshop safety procedures.
- 2 Interpret basic engineering drawings and use appropriate measuring equipment to manufacture components to a specified tolerance.
- 3 3. Manufacture basic engineering components using:
 - Hand tools
 - Hand Power tools
 - Power machines (radial drills bench presses etc...)
 - Lathes
 - Milling machines
 - Engravers
 - CNC machines
 - MMAW (Manual metal arc welding)
 - GMAW (Gas metal arc welding)
 - GTAW (Gas Tungsten arc welding)
 - Hard soldering/brazing/soft soldering

NQF Sub-strand

Practical
Application of
knowledge
Practical
Application of
knowledge
Practical
Application of
knowledge

Topics / Content**• Safety**

Instruction on the safe working procedures required to operate machines and equipment and the correct use of personal protective equipment.

• Measuring equipment

Care and use of measuring equipment including, vernier and digital calipers, micrometers and dial test indicators. Care and use of surface tables and angle plates.

• Use of Bench fitting tools

Dividers, scribes, centre punches, files, vices, folding machines, clamps.

• Screw Threads

Cutting of internal and external threads by the use of taps and dies. The use of screw pitch gauges and charts to positively identify standard thread types.

• Drilling

Correct use of drilling machines and different drill bits. Selection of cutting tools and speeds and coolants used for the machining of a range of materials

• Lathe Work

Parallel turning, taper turning using compound-slide, screw cutting, knurling, drilling and parting-off of work exercises. Selection of spindle speeds, feeds and coolants. Use of different work-holding devices.

• Milling

Use of vertical/horizontal and/or universal milling machines, correct set-up and the secure clamping of work piece, correct speed and feed and cutter selection. The correct relationship between cutter rotation and direction of feed.

• Fabrication

Use, from the indicative range cited, fabrication processes to join materials.

MMAW – GMAW - GTAW – OAW – hard soldering/brazing

• Projects

Each student will complete one main practical project and workshop exercises to obtain the necessary skills of machine-shop and fabrication applications including drilling, lathe, milling.

Learning and Teaching Strategies

The major emphasis is on practical achievement. Problem and project based learning, tutorials. During workshop sessions students will be given group demonstrations and individual instruction as required. They will also be given the opportunity to discuss their work in detail at anytime.

Completion Requirements

To obtain a Pass grade, a student must achieve a minimum of 60% aggregated over all assessments.

Assessment	Assessment Task Description	Weight (%)	Must Pass (Y/N)	Learning Outcomes Assessed	Form of Assessment Task
Assessment Method	<p>Practical Project:</p> <p>Practical project covers a broad range of underpinning knowledge and practical skills specified in 'course context' Emphasis is on developing practical problem solving skills</p>	60%	N	1,2,3	Practical project
	<p>Workshop Exercises:</p> <p>A range of smaller workshop exercises will extend experience gained from the practical project and/or provide consolidation</p>	20%	N	1,2,3	Practical project
	<p>Workshop Report:</p> <p>Report will demonstrate relevant underpinning knowledge gained and provide consolidation. (Assessed in conjunction with English tutors) Workshop logbook will be reference source for report content</p>	20%	N	1,2,3	Reflection
Assessment Method	Achievement				