

## MODULE DESCRIPTOR

### Module Title

Manufacturing Technology

Reference	EN2704	Version	4
Created	March 2024	SCQF Level	SCQF 8
Approved	March 2021	SCQF Points	30
Amended	April 2024	ECTS Points	15

### Aims of Module

To provide the student with a fundamental understanding of the main manufacturing processes of metals, ceramics, polymers and composite materials.

### Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Compare the fundamental metal forming, metal casting and sheet metalworking processes including forging and extrusion.
- 2 Report how the powder metal processes and equipment are used.
- 3 Compare processing techniques for ceramics, plastic, rubber and composite materials.
- 4 Report how the fundamental material removal processes, machine operations and machine tools can be used.
- 5 Compare different manufacturing processes for a given product.

### Indicative Module Content

Fundamental of metal casting (solidification of metals, fluidity of molten metal and defects), metal casting processes and equipment, design considerations in casting, economics of casting. Metal forming and sheet metalworking: fundamentals of metal forming, bulk deformation processes in metal working (rolling, forging, extrusion, wire and bar drawing), sheet metalworking (cutting, bending and drawing operations, dies and presses for sheet metal processes). Powder metal processes and equipment: powder metallurgy, production and compaction of metal powder, pressing and sintering techniques, design considerations. Shaping processes for plastics (extrusion, injection, blow and rotational moulding, compression, casting, thermoforming). Shaping ceramics, forming and shaping glass, strengthening and annealing glass. Shaping polymer matrix composites (open mould, closed mould processes), rubber processing and shaping. Theory of metal machining, material removal processes (turning, drilling, milling, grinding), cutting tool technology (tool life, material and geometry), economics and product design considerations in machining, advanced machining processes and equipment.

**Module Delivery**

This module is delivered using lectures supported by tutorial sessions, laboratory work, and directed study.

**Indicative Student Workload**

	Full Time	Part Time
Contact Hours	80	N/A
Non-Contact Hours	220	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	300	N/A
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

**ASSESSMENT PLAN**

If a major/minor model is used and box is ticked, % weightings below are indicative only.

**Component 1**

Type:	Coursework	Weighting:	100%	Outcomes Assessed:	1, 2, 3, 4, 5
Description:	A portfolio of evidence.				

**MODULE PERFORMANCE DESCRIPTOR****Explanatory Text**

The module has 1 component and to gain an overall pass, a minimum D grade must be achieved.

Module Grade	Minimum Requirements to achieve Module Grade:
<b>A</b>	A
<b>B</b>	B
<b>C</b>	C
<b>D</b>	D
<b>E</b>	E
<b>F</b>	F
<b>NS</b>	Non-submission of work by published deadline or non-attendance for examination

**Module Requirements**

Prerequisites for Module	Completion of EN1703 or equivalent.
Corequisites for module	None.
Precluded Modules	None.

**INDICATIVE BIBLIOGRAPHY**

- 1 CALLISTER W.D., RETHWISCH, D. G., 2014. Materials Science and Engineering. 9th Edition SI Version, New York: Wiley
- 2 KALPAKJIAN, S. and SCMID, S., 2014. Manufacturing engineering & technology. 7th edition. Harlow: Pearson.
- 3 GROOVER M.P., 2016. Principles of modern manufacturing. Global Edition SI Version. New York: Wiley.