

## MODULE DESCRIPTOR

### Module Title

Manufacture and Material 2

Reference	EN2102	Version	4
Created	February 2024	SCQF Level	SCQF 8
Approved	July 2018	SCQF Points	30
Amended	April 2024	ECTS Points	15

### Aims of Module

To provide the student with the fundamental understanding of the main manufacturing processes and the ability to select appropriate materials for a given product.

### Learning Outcomes for Module

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

- 1 Understand the fundamentals of metal forming, sheet metalworking including rolling, forging and extrusion, and powder metal processes.
- 2 Show appropriate processing techniques for ceramics, glasses, plastic, rubber and composite materials.
- 3 Practice the fundamentals of material removal processes, machine operations and machine tools.
- 4 Use working procedures that enhance quality and mitigate risk.
- 5 Undertake selection of appropriate materials and their manufacturing processes for a given product.

### Indicative Module Content

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. Metrology and quality control. Safe working procedures and risk assessment.

### Module Delivery

The module is delivered in Blended Learning mode using structured online learning materials/activities and directed study, facilitated by regular online tutor support. Workplace Mentor support and work-based learning activities will allow students to contextualise this learning to their own workplace. Face-to-face engagement occurs through annual induction sessions, employer work-site visits, and modular on-campus workshops.

### Indicative Student Workload

	Full Time	Part Time
Contact Hours	30	N/A
Non-Contact Hours	30	N/A
Placement/Work-Based Learning Experience [Notional] Hours	240	N/A
TOTAL	300	N/A
<i>Actual Placement hours for professional, statutory or regulatory body</i>	240	

### ASSESSMENT PLAN

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

#### Component 1

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	1, 2, 3, 4
Description:	A portfolio of practical activities and assignments.				

#### Component 2

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	5
Description:	Evaluation incorporating a logbook, an oral presentation and demonstration followed by a reflective statement.				

### MODULE PERFORMANCE DESCRIPTOR

#### Explanatory Text

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 50% and C2 is worth 50%.

		Coursework:						
		A	B	C	D	E	F	NS
Coursework:	A	A	A	B	B	E	E	
	B	A	B	B	C	E	E	
	C	B	B	C	C	E	E	
	D	B	C	C	D	E	E	
	E	E	E	E	E	E	F	
	F	E	E	E	F	F	F	
	NS	Non-submission of work by published deadline or non-attendance for examination						

### Module Requirements

Prerequisites for Module	Completion of EN1100, EN1106, EN1102, EN1103 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.