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MODULE DESCRIPTOR

Module Title

Manufacturing Technology

Reference	EN2704	Version	3
Created	March 2023	SCQF Level	SCQF 8
Approved	March 2021	SCQF Points	30
Amended	August 2023	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 Distinguish the fundamentals of metal forming, metal casting and sheet metalworking including rolling, forging, and extrusion.
- 2 Compare the powder metal processes and equipment.
- 3 Show appropriate processing techniques for ceramics, plastic, rubber and composite materials.
- 4 Show the fundamentals of material removal processes, machine operations and machine tools.
- 5 Undertake appropriate 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

The module will essentially be student-centered but will be supported by lectures, demonstrations, and videos, where appropriate. It will involve the student in working to solve problems related to real engineering products. The student will be given set objectives and will generally be expected to follow prescribed procedures

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 in each component. The component weighting is worth 100%.

Module Grade	Minimum Requirements to achieve Module Grade:
A	A
B	B
C	C
D	D
E	E
F	F
NS	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.