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## MODULE DESCRIPTOR

### Module Title

Introduction to Design, Materials and Manufacture

Reference	EN1701	Version	9
Created	August 2021	SCQF Level	SCQF 7
Approved	March 2004	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

### Aims of Module

The aim of this module is to provide an introduction to design, materials and manufacture in an engineering context.

### Learning Outcomes for Module

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

- 1 Identify and apply engineering design methods to analyse design examples using appropriate design process.
- 2 Explain the selection of materials in manufacturing and associated process.
- 3 Understand customer needs and constraints on the manufacturing processes.
- 4 Understand manufacturing processes, including concepts of measurement and metrology.

### Indicative Module Content

This module will be activity centred and will introduce the student to the principles of the engineering design process for product development. It will introduce the principles of design as a process of meeting both customer and organisational needs while taking account of constraints. It will demonstrate the inter-relationship of design, materials, manufacture and test and how these relate to other non-technical factors. Students will learn the principles of materials technology including the structure and properties of representative engineering materials. Similarly, students will appreciate the main manufacturing processes and their capabilities and limitations. These principles will be applied in activities which will demonstrate the principles of inventive but realistic design and the criteria for the selection of materials and processes. The principles will be applied in context and the students will consider how market criteria and organisational imperatives affect the optimum solution to a design problem.

### Module Delivery

The module will be essentially student centred but will be supported by lecture, demonstration, industrial visits and video where these are felt to be appropriate. It will involve the student working to tackle problems relating to real mechanical engineering products. The student will be given set objectives and will in general be expected to follow prescribed procedures.

**Indicative Student Workload**

	Full Time	Part Time
Contact Hours	55	55
Non-Contact Hours	95	95
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
Actual Placement hours for professional, statutory or regulatory body		

**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:	4
Description:	Report.				

**Component 2**

Type:	Examination	Weighting:	50%	Outcomes Assessed:	1, 2, 3
Description:	A closed book examination.				

**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%.

		Examination:						
		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	E	F	F	
	NS	Non-submission of work by published deadline or non-attendance for examination						

**Module Requirements**

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

**ADDITIONAL NOTES**

The student will be provided suitable clothing for laboratory and workshop activities as designated by University staff.

**INDICATIVE BIBLIOGRAPHY**

- 1 ULRICH, K.T. and EPPINGER, S.D., 2016. Product Design and Development. 6th ed. New York: McGraw-Hill.
- 2 TIMINGS, R.L., 2000. Manufacturing Technology: volume 1. 2nd ed. Harlow: Longman.
- 3 CALLISTER W.D. and RETHWISCH, D.G., 2015. Materials Science and Engineering. 9th ed. New York: Wiley.
- 4 Jack, Hugh, Engineering design, planning, and management. 2022. London, United Kingdom : Academic Press