

<b>Module Title:</b>	<b>Manufacturing, Design &amp; Technology</b>	<b>Level:</b>	5	<b>Credit Value:</b>	20
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<b>Module code:</b>	ENF507	<b>Is this a new module?</b>	No	<b>Code of module being replaced:</b>	
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<b>Cost Centre:</b>	GAME	<b>JACS3 code:</b>	H712
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<b>Trimester(s) in which to be offered:</b>	1, 2 & 3	<b>With effect from:</b>	September 16
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<b>School:</b>	Applied Science, Computing & Engineering	<b>Module Leader:</b>	Bobby Manesh
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Scheduled learning and teaching hours	60 hrs
Guided independent study	140 hrs
Placement	0 hrs
<b>Module duration (total hours)</b>	<b>200 hrs</b>

<b>Programme(s) in which to be offered</b>	Core	Option
FdEng Industrial Engineering	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Pre-requisites</b>
None

<b>Derogations</b>
A derogation from regulations has been approved for this module which means that whilst the pass mark is 40%, each element of assessment requires a minimum mark of 30% for the module to be passed overall.

Office use only

Initial approval June 16

APSC approval of modification *Enter date of approval*

Have any derogations received SQC approval?

Version 1

Yes  No

**Module Aims**

To develop a deeper knowledge and understanding of manufacturing processes, technologies and equipment, also examine the design implications affecting the manufacturing process.

**Intended Learning Outcomes**

Key skills for employability

- KS1 Written, oral and media communication skills
- KS2 Leadership, team working and networking skills
- KS3 Opportunity, creativity and problem solving skills
- KS4 Information technology skills and digital literacy
- KS5 Information management skills
- KS6 Research skills
- KS7 Intercultural and sustainability skills
- KS8 Career management skills
- KS9 Learning to learn (managing personal and professional development, self-management)
- KS10 Numeracy

At the end of this module, students will be able to

Key Skills

At the end of this module, students will be able to		Key Skills	
1	Interpret a design brief and produce a design specification through researching and synthesising alternatives	KS1	KS10
		KS3	
		KS4	
2	Select suitable machining processes and techniques for generating various geometrical forms to a given specification	KS1	KS10
		KS3	
		KS4	
3	Analyse manufacturing methods with consideration to economics and quality issues.	KS1	KS10
		KS3	
		KS4	

**Assessment:**

The portfolio will incorporate all design work, inclusive of analysis of the theoretic aspects of manufacturing, simulations, drawings and details of practical work supporting the theory.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	1-3	Portfolio	50%		2000
2	1-3	Portfolio	50%		2000

**Learning and Teaching Strategies:**

A series of lectures, supported by relevant video and tutorial sessions will provide the principles and theoretical aspects of the module. Whilst the practical aspects will be developed in the machine shop and computer labs or from on-site experience and work integrated assignments.

**Syllabus outline:**

- Manufacturing methods: selection of methods, key design factors: - design form, materials type and properties, quality requirements, available equipment, processing capability, costs, labour skills. Analysis of methods, design criteria, decision criteria (which, why, alternatives, suitability).
- Total Costs: material, labour, overheads; fixed and variable costs; relationships of manufacturing method, complexity of design form, surface finish, relative cost. Break-even analysis.
- Standardisation: BS/ISO/industry-specific standards relevant to design form/materials; standard components/parts/fittings; preferred number methods for detection and standardisation; cost advantages of standard parts (design, development, tooling, planning, choice, labour); ease of replacement, interchangeability. Advantages and disadvantages.
- Process requirements: factors affecting material requirements: - form, size, weight, processing method, quality, quantity, availability, service life, characteristics (mechanical, electrical, chemical).
- Economic Assembly: analytical (questioning) approach to select method. 'Value Engineering' approach: evaluate specification, validity of product; minimise variation between similar components, sequencing of assembly stages; symmetrical and asymmetrical parts; justify number of components used; suitability for automatic feed and assembly (FMS and robots), unidirectional component location, ease of handling, positioning, stacking, accessibility within assembly.

**Bibliography:**

**Essential reading**

Serope Kalpakjian (2009) *Manufacturing Engineering and Technology*, Pearson

**Other indicative reading**

Helmi A Youssef (2011) *Manufacturing Technology*, CRC Press

Rob Thompson (2007) *Manufacturing Processes for Design Professionals*, Thames & Hudson