

Module Code	ACEA7004
Title	Design for Manufacture
Date	12/07/2019
Level	7
Credits	20
Pre-Requisites	None

AIM(S)

- To provide a comprehensive understanding of the implications of sustainable manufacturing factors for component and assembly design.
- To provide the skills, tools and techniques to enable product or system designs to be analysed and optimised with regard to manufacturability and assembly.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Analyse a range of manufacturing-related considerations and apply these in the generation of appropriate manufacturing/design solutions.
- Analyse the requirements for other factors relevant for design (e.g. recycling and re-use, reliability, maintainability, recyclability, sustainability) and specify appropriate design features.

INDICATIVE CONTENT

- Design for Six Sigma and Design for Lean Manufacture - design implications of major processes: machining, casting, forming, polymer moulding, sheet materials and extrusion. Redesign of existing products for alternative materials and processes.
- Design for 'X' - recycling, reliability, maintainability, sustainability
- Value stream mapping for product design and development activities.
- Computer Aided Manufacturing principles and techniques, Computer Aided Design for manufacture applications, manufacturing/production simulation and optimisation applications.
- Design for manual and automated assembly.
- Tolerance Design. Mechanical tolerance stack-up & analysis (for assemblies). Geometric Dimensioning & Tolerancing.
- Quality of Design Techniques – Failure Mode and Effects Analysis (design and process), Quality Function Deployment.
- Inventive problem solving techniques in the context of Design. TRIZ, SCAMPER,
- Poke Yoke Error-proofing. Families of components. Value analysis and value engineering. Economics of process selection. Integration of Design and Manufacture.

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Assignment	6,000 words equivalent (including Appropriate Manufacturing / Design Documentation e.g. solid model files or machine code.	100%

Assessment Summary

Activity type	Percentage
Written exam	0%
Coursework	100%
Practical	0%
TOTAL	100%