

Module specification

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Module Code	ENG4AR
Module Title	Engineering Computer Applications
Level	4
Credit value	20
Faculty	FAST
HECoS Code	100160
Cost Code	GAME
Pre-requisite module	L3 Computer Aided Manufacturing (or similar)

Programmes in which module to be offered

Programme title	Core/Optional/Standalone
HNC Mechanical Technology	Core

Breakdown of module hours

Learning and teaching hours	60 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	0 hrs
Project supervision hours	0 hrs
Active learning and teaching hours total	60 hrs
Placement hours	0 hrs
Guided independent study hours	140 hrs
Module duration (Total hours)	200 hrs

Module aims

To develop knowledge and understanding of computers applied to assist in specification analysis, design, manufacturing and launch of a product. To apply industry-standard CAE software to become more IT literate and more competent in activities such as file handling.

Module Learning Outcomes

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

1	Define basic concepts, elements and hardware requirements of CAE.
2	Investigate and analyse CAE in design applications.
3	Investigate and analyse CAE in manufacturing applications.

Assessment

Indicative Assessment Tasks:

Assessment is 100% in-course. This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment 1: Outcome 1, 2 would be assessed by student producing a portfolio of short reports include written overview of design process, some research using journals, textbooks and the internet, and CAD practical exercises with implemented British Standards.

Assessment 2: Outcome 3 would be assessed by the student producing a report of overview of manufacturing processes (included Rapid Prototyping), and practical exercises of machining simulation.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1,2	Portfolio	2000 words	50%	
2	3	Coursework	2000 words	50%	

Derogations

None

Learning and Teaching Strategies

The major learning strategy is practical-based learning in the CAD laboratory. Occasional lectures and demonstrations are used to disseminate theory and to demonstrate the more complex software. A portfolio to include a written overview and practical work on outcomes, but some research using journals, textbooks and the internet will be carried out.

Welsh Elements

This module will be delivered through the medium of English; however, students have the option to submit their assessments in the medium of Welsh. While this module is not currently offered fully through Welsh, Welsh language support and guidance are available, and some learning materials or tutorial discussions may incorporate Welsh elements where appropriate.

Indicative Syllabus Outline

Basic concepts

Elements of CAE, the product development process, computer hardware, CAE case studies.

Computer Aided design

System management; 2D design, limits, creating and editing drawings, blocks, layers, dimensioning; British Standards, 3D design, rendering, plotting, introduction to solid modelling

Computer Integrated Manufacture

Design for CNC, computer simulation of manufacturing systems. Use of Rapid prototyping system.

Indicative Bibliography

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads:

Hansen L. (2020) Autodesk Inventor 2021, Stephen Schroff

Redwood B. (2017) The 3D Printing Handbook: Technologies, design and applications, 3D Hubs B.V.

Simmons H., Maguire D., Phelps N. (2020) Manual of Engineering Drawing to British and International Standards 5th ed., Butterworth Heinemann

Other indicative reading:

McMahon, C., Browne, J. (1999) CAD/CAM, Principles, Practice and Manufacturing Management, 2nd ed., Addison-Wesley

Hannan, R. (1997) Computer Integrated Manufacture From Concepts to Realisation. Addison-Wesley.

Administrative Information

For office use only	
Initial approval date	6 July 2021
With effect from date	September 2021
Date and details of revision	6 July 2021, revalidated. /05/2026 updated to new template and module changed from optional to core during re-validation.
Version number	Version 2