

Module specification

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Module Code	ENG436
Module Title	CAD/CAM
Level	4
Credit value	20
Faculty	FAST
HECoS Code	100374
Cost Code	GAME
Pre-requisite module	None

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 provide integration of the two subject areas of computer-aided design and computer-aided manufacture (CAD/CAM). It will enable the student to acquire a broader and deeper understanding of the practical applications of a CAD/CAM system.

Module Learning Outcomes

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

1	Produce a component drawing suitable for machining and transfer onto a CAM system.
2	Create a 3D simple surface and use Rapid prototyping to produce a component.
3	Transfer data generated in CAD to a CAM system for subsequent machining.
4	Simulate the cutter paths on a CAM system to optimise the machining sequences.

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: Portfolio 1 will include a short report and pictures of CAD modelling, pictures of the model produced in RP, as well as computer files if necessary.

Assessment 2: Portfolio 2 will include a short report and pictures of the simulated paths and a Numerical Code file (first & last pages) generated by the programme.

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	3,4	Portfolio	2000 words	50%	

Derogations

None

Learning and Teaching Strategies

The module will be introduced to learners through a specific series of tutorials assisted by notes via VLE platform. The major learning strategy is practical-based learning in the CAD CAM laboratory. Demonstrations will be used to introduce the software and occasional lectures used to disseminate theory. Relevant videos will also be used to aid the learning process.

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

Component drawing:

Configure the hardware contained within a typical CAD workstation. Production of CAD profiles using the more common types of editing facilities. Drawing attributes and structure with specific reference to associated profile data and parts listing.

3D Surface:

Use of world axis to produce geometry suitable for transfer to a CAM system. 3D surfaces generated for visualisation and subsequent machining.

Transfer data:

Structured CAD data with reference to suitable datum and direction lines. Methods of transfer: STEP, DXF and IGES. CAD layers used to help tooling sequences with consideration to tool changes.

Cutter Paths:

Tooling sequences optimised by using simulated cutting times generated within CAM system. Tooling data files containing calculated speeds and feeds to suit component material. Cutting direction and offset determined with due consideration for component accuracy and finish. Clamping and general workholding safety considered with reference to clamping methods including program controlled clamping. Numerical Code generation. Generation of .stl file from 3D geometry for transfer to Catalyst software and generation of tool paths for Rapid Prototyping.

Indicative Bibliography

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

Essential Reads:

Norton R. L. (2020) CAM Design and Manufacturing Handbook. Norton Associates LLC, 3rded.

Sareen, K. K., Grewel, C. S. (2007) Cad-Cam: Theory and Concepts. S Chand & Co Ltd

Other indicative reading:

Groover M. (2008) CAD/CAM: Computer-Aided Design and Manufacturing. Pearson Technology

Rembold. U., Nnaji, B. O., Store, A. (2000) *Computer Integrated Manufacturing and Engineering*. Addison-Wesley, 3rded.

Administrative Information

For office use only	
Initial approval date	August 2016
With effect from date	September 2021
Date and details of revision	6 July 2021, revalidated. 05/05/2026 updated to new template and changed from optional to core during re-validation.
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