

## Module specification

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Module Code	ENG496
Module Title	Design and CAD
Level	4
Credit value	20
Faculty	FAST
HECoS Code	100160
Cost Code	GAME

### Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BEng (Hons) Production Engineering	Core
BEng (Hons) Industrial Engineering Design (Mechanical)	Core
BEng (Hons) Industrial Engineering Design (Electrical & Electronic)	Core
BEng (Hons) Low Carbon Energy, Efficiency and Sustainability	Core
FdEng Industrial Engineering (Mechanical)	Core
FdEng Industrial Engineering (Manufacturing and Production)	Core
FdEng Industrial Engineering (Electrical and Automation)	Core

### Pre-requisites

None

### Breakdown of module hours

Learning and teaching hours	40 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs

Learning and teaching hours	40 hrs
<b>Total active learning and teaching hours</b>	<b>40 hrs</b>
Placement / work based learning	0 hrs
Guided independent study	160 hrs
<b>Module duration (total hours)</b>	<b>200 hrs</b>

<b>For office use only</b>	
Initial approval date	11/09/2019
With effect from date	11/09/2019
Date and details of revision	30/01/20 Admin update of derogation 05/08/20 Addition to FdEng Industrial Engineering as optional module 21/09/20 approved addition of BEng Low Carbon Energy, Efficiency and Sustainability Oct 2 minor modification to LO wording through the revalidation and template update Sept 22 addition of FdEng programmes March 2023 Replacement of LO4 and assessment type changed to one portfolio
Version number	5

## Module aims

The module will provide an opportunity to develop a practical insight into, and experience of, the core engineering design concerns and link this with a variety of engineering activities, including product architecture, design for manufacture, and detailed engineering to design products to customer specifications and the use of design software (CAD) within that process

## Module Learning Outcomes - at the end of this module, students will be able to:

1	Apply consideration to discrete issues in engineering design to satisfy customer specifications.
2	Create solid geometrical parts using a variety of fundamental construction techniques using industry standard solid modelling systems
3	Use drafting tools to generate 2D drawings from 3D geometrical parts and apply dimensional and geometrical tolerances to engineering drawings
4	Implement sustainability and ethical practices in the design process

In addition to the module learning outcomes, students will also cover the following accreditation of higher education programme (AHEP) fourth edition learning outcomes: F3 & F7 for FdEng programmes and C3 & C7 for BEng degree apprenticeship programmes.

## Assessment

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Indicative Assessment Tasks:

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: A portfolio to cover all learning. An example would be the design of a specific product or system to meet a defined brief. Sustainability and ethics will be at the fore of the design process and final concept. This could include a proposal, presentation and final report/CAD model

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1-4	Portfolio	100

## Derogations

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A derogation from regulations has been approved for this module which means that whilst the pass mark is 40% overall, each element of assessment (where there is more than one assessment) requires a minimum mark of 30%.

## Learning and Teaching Strategies

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The module will be presented to students through a specified series of lectures assisted by notes via the University's VLE platform. Lectures will deliver key concepts, ideas, theories and examples.

Tutorials will allow the further exploration of the lectures and use exercises to give students the opportunity to investigate subject specific knowledge through individual work.

Self-study exercises and reading are also given as well as the desire to develop the own learning and competence, demonstrating willingness to learn and develop new skills.

Relevant videos will also be used to aid the learning process.

## Indicative Syllabus Outline

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Design: Phases of design, Evaluation, Design considerations. Engineering codes and standards. Ethical considerations. Designing for export: standards, regulations and quality.

Customer Requirements: Define the task to be carried out. Develop a product architecture and design specification.

CAD: 2D drawings and 3D modelling technique using industrial CAD software

Engineering Drawings: BSI & ISO: System of dimensional tolerances, limits and fits. Type of fits for mating parts. Geometrical tolerances and feature control frame. Surface finishes.

Sustainability – Environmental, economic and societal sustainability. Current and future responsibilities as an engineer to inclusivity and diversity

## **Indicative Bibliography:**

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Please note the essential reads and other indicative reading are subject to annual review and update. Please *ensure correct referencing format is being followed as per University Harvard Referencing Guidance*.

### **Essential Reads**

C. Simmons and D. Maguire, *Manual of Engineering Drawing Technical Product Specification and Documentation to British and International Standards*. 4<sup>th</sup> ed. Amsterdam: Elsevier/Butterworth-Heinemann, 2012.

### **Other indicative reading**

D. A. Norman, *The Design of Everyday Things*. Cambridge, MA: The MIT Press, 2013.

## **Employability skills – the Glyndŵr Graduate**

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Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

### **Core Attributes**

Engaged  
Enterprising  
Creative  
Ethical

### **Key Attitudes**

Commitment  
Curiosity  
Resilience  
Confidence  
Adaptability

### **Practical Skillsets**

Digital Fluency  
Organisation  
Leadership and Team working  
Critical Thinking  
Emotional Intelligence  
Communication