

Module specification

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Module Code	ENG6AF
Module Title	Product Design
Level	6
Credit value	20
Faculty	FAST
HECoS Code	100182
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BEng (Hons) Industrial Engineering Design (Mechanical)	Core
BEng (Hons) Low Carbon Energy, Efficiency and Sustainability	Core
BEng (Hons) Industrial Engineering (Mechanical)	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	30 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
Total active learning and teaching hours	30 hrs
Placement / work based learning	0 hrs
Guided independent study	170 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	11/09/2019

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With effect from date	11/09/2019
Date and details of revision	Approved on 21/09/20 for addition of BEng Low Carbon Energy, Efficiency and Sustainability Oct 21 minor modification to LO wording through the revalidation and template update Sept 22 addition of BEng (Hons) Industrial Engineering (Mechanical)
Version number	3

Module aims

The aim of this module is to develop skills in the conceptual design of products. Including product briefs, concept selection, project planning, management, team working and presentation skills. Students will apply advanced design principles to solve product design problems and develop an appreciation of the importance of the selection of appropriate materials and processes for economic and sustainable products.

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

1	Professionally express conceptual designs through a variety of different methods and methodologies based on research you have gathered.
2	Design, develop, test and produce a user centered product as a result of solving a real-world problem.
3	Critically explore the iterative design process, produce working prototype models, document decision making and apply critical thinking
4	Demonstrate a systematic understanding of and evidence a solution to a real world problem facing a person within the community.

In addition, to the module learning outcomes, student will also cover the following accreditation of higher education programme (AHEP) fourth edition learning outcomes: B1 & B3 for BEng (Hons) Industrial Engineering (Mechanical) and C1, C3, C11 & C17 for BEng degree apprenticeship programmes.

Assessment

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.

The assessments will be contained in an overall project-based portfolio with sections drawn from team and individual contributions. Typically, the student will be tasked to provide a portfolio containing the following sections as a minimum:

1. Project brief & logbook (Individual work)
2. Design Specification (Teamwork)

3. Concept development & selection process (Team and Individual contributions)
4. Outline designs, materials and component selections (Team and Individual contributions)
5. Detail drawings, CAD, models and calculations (Team and Individual contributions)
6. Product Prototype (Teamwork)
7. Reflective analysis and conclusions (Individual work)

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2, 3, 4	Portfolio	100

Derogations

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

Lectures - presentation of theory, facts and concepts, relating to product design, in order to convey critical information. Interaction or active learning should be implemented to develop an understanding of principles and concepts and stimulate discussion.

Tutorials – Close interaction with students ensuring that the work presented during lectures has been understood, with specific help being given in order to overcome any learning problems, should they occur.

Industrial visits or visits to design museums or similar organisations - in order to demonstrate product design principles being applied.

'Break out sessions and guest lecturers will be used to cover specific elements for sub-groups within the cohort.

Specialist knowledge and expertise from industrial partners can and will be disseminated to other students where relevant. e.g. design & production techniques.

Indicative Syllabus Outline

- Design process management, structured techniques such as concept selection and concept product screening techniques, thought showers, synectics and team working.
- Project planning, team working and networking.
- Use of software in static and dynamic analysis.
- Materials and Process selection methods.
- Application of knowledge to solve an engineering design problem

Indicative Bibliography:

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

N. Cross, Engineering Design Methods: Strategies for Product Design. Wiley, 2008.

Other indicative reading

D. A. Norman, *The Design of Everyday Things*. Cambridge. MA: MIT Press, 2014.

Employability skills – the Glyndŵr Graduate

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