

Module specification

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Module Code	ENG6B8
Module Title	Energy Saving, Low Carbon, and Recycling Systems
Level	6
Credit value	20
Faculty	FAST
HECoS Code	100175
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BEng (Hons) Renewable Energy and Sustainable Engineering	Option
MEng Renewable Energy and Sustainable Engineering	Option
BEng(Hons) Low Carbon Energy, Efficiency and Sustainability	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	15 hrs
Placement tutor support	0 hrs
Supervised learning e.g., practical classes, workshops	15 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	170hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	22 nd Aug 2022
With effect from date	Sept 2022
Date and details of revision	
Version number	1

Module aims

- To develop the skills and knowledge to engage critically with climate change problems and challenges for a transition toward a resilient, low-carbon future with a focus on energy saving and recycling.
- To develop a comprehensive depth of knowledge and clear understanding of major and complex theories, principles of energy saving and recycling systems.

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

1	Demonstrate best practice within carbon management together with analysing environmental impacts and financial viability of a range of carbon management measures.
2	Analyse the feasibility and predicted performance of a range of effective energy reduction measures for a typical project and make recommendations based on a range of criterion.
3	Analyse a range of techniques used to recycle a variety of common waste materials and design a recycling system based on a range of criterion and good practice.
4	Through analysis and reasoning be able to justify energy saving and recycling solutions.

In addition to the module learning outcomes, students will also cover the following accreditation of higher education programme (AHEP) fourth edition learning outcomes: C7.

Assessment

Indicative Assessment Tasks:

Assessment One: is by means of a report covering outcomes 1, 2, 3, and 4. It is an unseen time-constrained one with a fixed number of questions. Indicative wordcount 4000 words.

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 programme 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

The module will be presented to students through lectures and tutorials followed by team-work activities. An active and inclusive approach is used to engage learners in the topics and will involve individual, group work and flipped learning experiences aligned to the university's Active Learning Framework (ALF). The approach offers students a flexible and adaptive learning experience that can accommodate a range of options that includes both on campus learning and remote learning where appropriate.

The Moodle VLE and other on-line materials and resources will be available to support learning. ALF offers a balance between the classroom elements and digitally enabled activity incorporating flexible and accessible resources and flexible and accessible feedback to support learning.

The teamwork will be self-organised outside class times but will also be observed during programmed tutorial sessions. Access to specialist facilities, such as IT labs, will be arranged as required. The group work will culminate in a group presentation but will be assessed by means of individual reports.

Indicative Syllabus Outline

- An overview of the necessity and advantages to save energy and recycle including climate change and its link with carbon emissions together with the problems of waste.
- Life cycle analysis and whole life analysis.
- Low carbon technologies: Overview of low carbon energy saving technologies such as insulation, decarbonisation delivery mechanisms by sector, including buildings, transport, industry, and power generation.
- New innovations in the fields of energy saving and recycling.
- Energy reduction measures suitable for residential, business and industry.
- Carbon management case studies.
- Carbon audits, carbon offsetting and net zero accreditations.
- Sustainability product labelling systems
- Waste recycling systems and environmental waste disposal

Indicative Bibliography:

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

Essential Reads

J. Piper, *The Rubbish Book: A Complete Guide to Recycling*. UK: Unbound. 2022.

Other indicative reading

G. Blokdyk, *Environmental Audit a Complete Guide – 2020 Edition*, ASIN: B084L5XTLJ, 2020.

Energy and Resource Efficiency without the tears – **download free moodle.**
<https://www.sustainsuccess.co.uk/pdf>

Online carbon audit tools (constantly being updated)

Employability skills – the Glyndŵr Graduate

Each module and programme are 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