

Module Details	
Module Title	Sustainable Energy
Module Code	ENG6005-B
Academic Year	2022/3
Credits	20
School	Department of Mechanical and Energy Systems Engineering
FHEQ Level	FHEQ Level 6

Contact Hours	
Type	Hours
Laboratories	6
Lectures	30
Tutorials	4
Directed Study	160

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

Module Aims
Climate change is having an impact on communities around the world. In this module you will gain an understanding of the fundamentals of renewables and sustainable low-carbon technologies that can make a difference, and their commercial and management diversity.
The module will examine the fundamentals of sustainable energy including the design and management of renewable low-carbon sources, regulatory mechanisms and technologies, energy policy and business opportunities for these.

Outline Syllabus
1) Fundamentals of renewable and sustainable energy sources, technologies and industry structures.
2) Analysis and design of renewable sustainable energy systems, for example wind turbines and photovoltaic solar.
3) Evaluation of existing and future smart energy systems development and their challenges.
4) Analysis and understanding of energy supply systems design.
5) Understanding and critical analysis of: health and safety; ELSES (ethics / legal / social / environmental / sustainability) in the context of sustainable energy systems.

Learning Outcomes

Outcome Number	Description
LO1	Knowledge and understanding of different forms of energy and the various definitions of 'sustainable' energy
LO2	Analyse the relevance of sustainability to the design and implementation of energy systems
LO3	Critically evaluate the principal sources of primary energy in use today, their development over the past century, and the general patterns of world, regional and national energy consumption
LO4	Critically review the basic principles underlying the design and use of energy supply systems
LO5	Analyse/assess the implications of ethical, legal, social, environmental, sustainability and health and safety concerns in the context of sustainable energy systems and society.
LO6	Develop advanced skills in problem definition, problem solving techniques, group work, project management skills and technical report writing
LO7	Communicate the results and conclusions of sustainable energy systems analysis

Learning, Teaching and Assessment Strategy

This module will be delivered through a combination of lectures, tutorials, seminars and software-based lab sessions. Concepts, principles & theories are explored in formal lectures and reinforced through a significant amount of laboratory-based project and practical work.

==Summative assessment:==

1. A formal examination will assess the learning outcomes LO1, LO3, LO4 and LO6. The weighting of the summative exam is 70%.
2. A portfolio of laboratory reports up to approximately 3000 words and software-based simulation will be used as coursework. The lab report will assess the learning outcomes LO2, LO5 and LO7 and the weighting is 30%.

==Formative assessment:==

Feedback can be given on an interim portfolio submission (up to 2 reports or 600 words) before the summative submission of this coursework.

This module satisfies the below Learning Outcomes as specified by the Accreditation of Higher Education Programmes: Fourth Edition (AHEP4) as published by the Engineering Council in-line with the UK Standard for Professional Engineering Competence (UK-SPEC). These outcomes specify five key areas of learning which partially (C) or fully (M) meet the academic requirement for CEng registration: Science and Mathematics (1), Engineering Analysis (2-4), Design and Innovation (5-6), The Engineer and Society (7-11), and Engineering Practice (12-18). Further details of these learning outcomes can be found at <https://www.engc.org.uk/ahep/>

C1, M2, C2, M4, C4, M5, C5, M7, C7, M8, C8, M9, C9, M10, C10, M11, C11, M13, C13, M14, C14, M15, C15, M16, C16, M17, C17, M18, C18.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Examination - Closed Book	Examination closed book (2 Hrs)	70%
Summative	Coursework - Written	Portfolio of laboratory write-up technical report (3000 words)	30%
Formative	Coursework - Portfolio/e-portfolio	Formative assessment of interim portfolio submission (up to 2 reports or 600 words).	N/A

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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