



MODULE DESCRIPTION FORM

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

ME927 ENERGY RESOURCES AND POLICY

Module Registrar: Dr N Kelly nick@esru.strath.ac.uk	Taught To (Course): MSc Energy Systems and Environment (compulsory); MSc Offshore Renewable Energy; MSc Advanced Mechanical Engineering / with Energy Systems / with Aerospace	
Other Lecturers Involved: Dr W Dempster	Credit Weighting: 10	Semester: 1
Compulsory/ optional/ elective class	Academic Level: 5	Suitable for Exchange: Y

Required prerequisites

Note: It is the responsibility of ALL students to ensure that they satisfy the prerequisite knowledge for this module BEFORE adding as part of curriculum selection. If unsure, please contact the Module Registrar or discuss with your Programme/Year Adviser of Studies.

Programming skills:

Ability to utilise spreadsheets or programming to solve technical problems.

Mathematical skills:

Ability to differentiate and integrate, manipulate and solve algebraic equations, apply iterative techniques and interpolate.

Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
22	10							68	100

Educational Aim

This module examines sustainable options for energy production, supply and consumption in relation to the net zero transition now underway in many countries. The aim is to give students an understanding of current trends in energy conversion and the energy market, and to enable a critical evaluation of emerging ideas, technologies and policies especially in relation to new and renewable energy supply systems.

Learning Outcomes

On completion of the module the student is expected to be able to:

LO1 appreciate recent history and current trends in the energy sector.

LO2 understand the impact energy has on the local and global environment.

LO3 undertake an evaluation of energy conversion technologies.

LO4 have a working knowledge of legislative, economic and environmental constraints and drivers.

Syllabus

The module will cover the following topics.

1. Historical trends in energy production: fossil fuels; renewable energy; nuclear power.
2. Atmospheric pollution: global and local; UK and international commitments.
3. Thermal power generating plant: efficiency; emissions; combined cycle plant; CHP.
4. Nuclear plant: history of technology; environmental impacts; policy issues.
5. Renewable energy sources: resource characteristics; exploitation methods; environmental impacts; costs.
6. Energy efficiency measures: demand-side management; storage and conversion techniques.
7. The transport sector: fuel use and emissions; environmental impacts; options for change.
8. Policy issues: support mechanisms for renewables; CO2 stabilisation strategies; role of nuclear power; demand reduction.

Assessment of Learning Outcomes

Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:
For each Module Learning Outcome, the following criteria will be used to make judgements on student learning.

LO1 an appreciation of recent history and current trends in the energy sector.

C1 ability to relate present actions in energy systems design and deployment to future requirements.

LO2 an understanding of the impact energy has on the local and global environment.

C1 ability to qualitatively relate technology types to impacts.

LO3 the ability to undertake an evaluation of developments in renewable energy conversion technology.

C1 Ability to quantitatively assess and compare alternative technologies.

LO4 a working knowledge of legislative, economic and environmental constraints and drivers.

C1 ability to explain principal reasons behind the development of low carbon technologies and the low carbon economy in general.

The standards set for each criterion per Module Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessment.

Principles of Assessment and Feedback

(within Assessment and Feedback Policy at: <https://www.strath.ac.uk/professionalservices/staff/policies/academic/>)

Assessment of student performance within the module will be wholly-based on an end-of-semester exam. This will be used to gauge the student's understanding of trends in the energy sector along with scientific, policy and economic drivers; the impact of energy and the environment; and the students' ability to undertake technical evaluations of energy technologies.

Informal feedback will be provided by staff at compulsory weekly tutorial sessions, where students will be expected to participate in group discussions and tackle technical problems, with groups presenting the outcomes of their discussion or technical challenge back to staff and their peers.

Feedback will also be delivered in lectures, to address any collective shortcomings that emerge from the tutorials in relation to the learning outcomes.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams (*individual weightings*)

Examination				Coursework		Practical		Project	
Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting	Number	Weighting
1	Dec	2hrs	100%						
All LOs									

* **L/Os:** Indicate which Learning Outcomes (L01, L02, etc) are to be assessed by exam/coursework/practical/project as required.

Coursework / Submission deadlines (*academic weeks*):

Resit Assessment Procedures:

Submission of ^coursework to be handed-in prior to the August exam diet.

^^Students must contact the module Registrar for details as soon as results confirm that a resit is required

PLEASE NOTE:

Students must gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-assessed prior to the August diet. This re-assessment will consist entirely of a piece of coursework. No marks from any previous attempts will be transferred to a new resit attempt.

Recommended Reading

***Purchase recommended **Highly recommended reading *For reference

Mackay D, 'Sustainable energy – without the hot air', <http://www.withouthotair.com/>. **

Godfrey B (Ed), 'Renewable energy: power for a sustainable future', Oxford University Press, ISBN 0-19-926178-4. *

IET, 'Energy Technologies for Net Zero', available at: <https://www.theiet.org/impact-society/factfiles/energy-factfiles/energy-generation-and-policy/energy-technologies-for-net-zero/>

Additional Student Feedback

(Please specify details of when additional feedback will be provided)

Date	Time	Room No
Announced in class		Check Myplace for details

Session: 2023/24

Approved:

Course Director Signature: Olga Ganilova

Date of Last Modifications: 24/08/23

