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:	**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 rudimentary 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**
18	10						12	60	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 technologies, policies and the energy market, and to enable a critical evaluation of emerging ideas, especially in relation to 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 evaluations 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.

- Scientific and policy drivers for the clean energy transition.
- Historical trends in energy production: fossil fuels, nuclear power, and renewables.
- Greenhouse gas emissions reductions: global and local; international and UK perspectives.
- Conventional thermal power generating plant: efficiency, emissions; combined, cycle plant.
- Nuclear plant: technologies, environmental impact, costs.
- Renewable energy sources: solar, wind, wave, tidal, hydro conversion technologies, resource characteristics, environmental impacts, costs.
- Decarbonisation of heat: demand reduction, technologies (heat pumps, hydrogen), flexibility and demand-side management.
- Decarbonising transport: fuel use and emissions environmental impacts, options for change – batteries, biofuels, hydrogen.

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 based on an end-of-semester exam and short coursework. These 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 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 as required.

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	80%	1	20%				
All LOs				LO1					

* ***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*): Week 5

Resit Assessment Procedures:
Submission of alternate coursework(s)** prior to commencement of the July/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 July/August exam 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: 2024/25

Approved:

Programme Lead/Director Signature: Dr A McLaren

Date of Last Modifications: 21/08/2024

(MAE template updated July 2024)

MODULE TIMETABLE

Module Code:	**ME927**	**Module Title:**	**Energy Resources and Policy**

Brief Description of Assessment:

The module will be assessed by a 2-hour exam held during the exam period and short coursework.

Assessment Timing

Indicated on the table below are the start/submission dates for each assignment/project and the timing of each exam/assessment.

Please note: Timings could change during unforeseen periods of disruption; this should only be used as a guide.

Semester One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Course work Set	Choose an item. Choose an item.	Choose an item. Choose an item.	Course work Submit	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Exam

Semester Two	C&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item.