

MODULE DESCRIPTION FORM

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

16110 ENERGY AND THE ENVIRONMENT

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|---|---|-------------------|--------------------------|
| Module Registrar: Dr W Dempster william.dempster@strath.ac.uk | Taught To (Course): Mechanical and Aerospace Engineering students | | |
| Other Lecturers Involved: | Credit Weighting: 10 (ECTS5) | | Semester: 1 |
| Assumed Prerequisites: Mathematics and Physics at SQA Higher level or equivalent | Elective class | Academic Level: 1 | Suitable for Exchange: Y |

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

| Lecture | Tutorial | Laboratory | Groupwork | External | Online | Project | Assignments | Private Study | Total |
|---------|----------|------------|-----------|----------|--------|---------|-------------|---------------|-------|
| 20 | | | | | 10 | | | 70 | 100 |

Educational Aim

This class aims to impart an understanding of the relationship between mankind's energy use and the environment, at both local and global levels, and to assess the technology options for the future.

Learning Outcomes

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

- LO1 To identify and explain the main issues of current UK and Global energy use.
- LO2 Describe basic technical principles of energy conversion from fossil fuels, nuclear power and renewable sources
- LO3 To be able to report and assess the energy demand/supply statistics for a range of UK sectors
- LO4 To be able to propose and discuss the feasibility of solutions for future energy use in the UK

Syllabus

The module will teach the following:

Patterns of energy use: historical, present-day and future projections. Fossil fuels: rates of depletion and requirements for alternative sources. Global warming: causes, consequences, influence on future policy. Alternatives: nuclear power and renewables. Technical aspects of energy supply systems: fossil fuels, nuclear power, hydro-electricity, tidal energy, ocean wave power, ocean thermal energy conversion, wind power, solar thermal and photovoltaic power, Potential scale of each resource, technology of conversion processes, conversion efficiency, Energy strategies for sustainable energy use.

Assessment of Learning Outcomes

Criteria

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

LO1 To identify and explain the main issues of current energy policy in the UK

- C1 The ability to source credible statistical data on energy consumption and supply at global and national levels
- C2 To explain the main drivers for current national energy policy strategies.
- C3 To propose the rudiments of a national level energy strategy for at least one energy sector

LO2 Describe basic technical principles of electricity energy production from fossil fuels, nuclear power and renewable sources

- C1 Explain the basic operation of energy conversion technologies for electricity generation
- C2 Describe the advantages and disadvantages of these technologies

LO3 To assess and report the energy requirements for heating and transport sectors

- C1 To describe and explain the energy conversion technologies associated with providing heating and transport
- C2 Describe the pro/cons of these technologies

LO4 To be able to propose and discuss the feasibility of national energy strategies for the UK

C1 To identify a number of high level energy strategies for the UK

C2 To be able to assess the feasibility of high level energy strategies

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/>)

Formal, summative feedback will be provided by the return of examination marks to students after assessment in December.

Informal feedback will be provided at regular tutorial sessions primarily through verbal discussion with individuals or groups on tutorial exercises attempted.

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 | 1.5 hours | 100% | | | | | | |
| * LO1,LO2,LO3,LO4 | | | | | | * | | * | |

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

Coursework / Submissions deadlines (academic weeks):**Resit Assessment Procedures:**

Submission of a coursework^{^^} (essay-based questions) 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 need to gain a summative mark of 40% to pass the module. Students who fail the module at the first attempt will be re-assessed before the July/August diet. This re-assessment will consist entirely of an essay-based coursework exercise. No marks from any previous attempts will be transferred to a new resit attempt.

Recommended Reading

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

Online access *Myplace* for class notes, tutorial and previous exam papers

***The Future of Energy* B Flowlar, Elsevier ISBN: 978-0-12-01027-3

***Sustainable Energy- Without the hot air*, David McKay 978-0954452933 (access at <http://www.withouthotair.com/>)

** additional texts and resources will be identified during the class

Additional Student Feedback

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

| | | |
|---|------------------|---------|
| Date | Time | Room No |
| Feedback will provided during each weekly class session in general and student specific on request. | Email to arrange | JW815e |

Session: 2025/26

Approved:

Programme Lead / Director Signature: Dr Andrew McLaren

Date of Last Modifications: 31 August 2025

MODULE TIMETABLE

Module Code:

16110

Module Title:

Energy and Environment

Brief Description of Assessment:

2-hour closed book online exam in December exam period – Time Bound Quiz (invigilated in person)

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.