

## MODULE DESCRIPTION FORM

### DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

## ME927 ENERGY RESOURCES AND POLICY

<b>Module Registrar:</b> Dr Nick Kelly <a href="mailto:nick@esru.strath.ac.uk">nick@esru.strath.ac.uk</a>	<b>Taught To (Course):</b> MSc Renewable Energy Systems and the Environment (compulsory), MSc Offshore Renewable Energy, MSc Advanced Mechanical Engineering / with Energy Systems / with Aerospace		
<b>Other Lecturers Involved:</b> Prof J A Clarke	<b>Credit Weighting:</b> 10	<b>Semester:</b> 1	
<b>Assumed Prerequisites:</b>	<b>Compulsory/ optional/ elective class</b>	<b>Academic Level:</b>	<b>Suitable for Exchange:</b> Y

#### 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						35	33	100

#### Educational Aim

This module examines sustainable options for energy production, supply and consumption in relation to the clean energy transition now underway in many countries. The aim is to give students an understanding of current trends in 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 have:

- LO1 An appreciation of recent history and current trends in the energy sector.
- LO2 An understanding of the impact energy has on the local and global environment.
- LO3 The ability to undertake an evaluation of developments in clean energy conversion technology.
- LO4 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 Module Learning Outcome, the following criteria will be used to make judgements on student learning, these will be applied in both coursework and exam.

- 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 compare alternative technologies.

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/staff/policies/academic/> )

Formal, summative feedback will be provided by the return of examination and coursework marks to students after assessment. Individual feedback on performance will be given on request.

Informal feedback will be provided at weekly tutorial sessions through discussion with individuals or groups on tutorial exercises attempted in advance. Students will receive weekly verbal feedback in the context of group discussions with supervising staff.

Performance in an individual assignment will be used to gauge student progress, with feedback given in group sessions that address collective shortcomings in relation to the learning outcomes. The coursework assignment comprises a techno-economic assessment of a renewable energy conversion system.

### Assessment Method(s) Including Percentage Breakdown and Duration of Exams

Examination				Coursework		Practical		Project	
Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting	Number	Weighting
1	Dec	2 hrs	75%	1	25%				
*All LOs				*All LOs		*		*	

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

### Coursework / Submissions deadlines (academic weeks):

Week 7

### Resit Assessment Procedures:

2hr examination in August diet.

### 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 during the August diet. This re-assessment will consist entirely of an exam / 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. \*

### Additional Student Feedback

Date	Time	Room No
Announced in class		Check timetable webpages for details

Session: 2019/20

### Approved:

Course Director Signature: *E Henderson*

Date of Last Modifications: 05/09/2019

