WM9RC-15 Emerging Renewable Energy Technologies

27/28

Department
WMG
Level
Taught Postgraduate Level
Module leader
Phil Lewis
Credit value
15
Module duration
4 weeks
Assessment
100% coursework
Study locations
University of Warwick main campus, Coventry Primary
ASOIU Baku Azerbaijan

Description

Introductory description

The Renewable Energy sector is developing globally at a rapid pace. It is essential that renewable energy professionals are constantly researching and exploring the viability of new concepts, emerging technologies and advances in efficiencies and effectiveness of existing renewable energy generation sources. This module provides students with the opportunity to investigate and understand the processes of engineering innovation, and the challenges of adopting emerging technologies. Students will be introduced to methodologies to research emerging technologies and evaluate their relevance and applicability to contextual locations. Students will complete a group exercise to create and disseminate a comprehensive technical report and from this the students will prepare an individual proposal which could be the basis of the student's final project/dissertation. The module will be delivered through a combination of face-to-face lectures, seminars and online guided synchronous and asynchronous learning.

When this module is delivered on Overseas Programmes, it is delivered in a 1-week block rather than over 4 weeks

Module aims

Engineers working in the renewable energy sectors will need to have the knowledge, understanding, and professional skills sets that will enable them to successfully propose and disseminate engineering solutions within a rapidly developing socio-technical environment. They will need to successfully employ new and emerging technologies to rapidly innovate and create complex renewable energy systems to meet the challenges of global warming. The principal aim of this module is to provide students with the analytical skills and methodologies to research and deploy emerging renewable energy technologies into relevant locations.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

The use of methodologies which provide clear routes to research an emerging technology and investigate its feasibility to provide an increase in energy production in the renewable energy portfolio or a reduction in cost of energy per unit to provide a reduction in carbon emissions whilst providing higher profitability. There are a number of methodologies listed below which enable the process of research and dissemination.:

Technology Innovation

Engineering design & development

Systems engineering

Typical Emerging technologies:

Hydrogen and derivatives

Artificial intelligence

Offshore Solar farms

Floating Wind farms

Geo – Thermal

Emerging Wave Technology

Emerging Tidal Technology

Learning outcomes

By the end of the module, students should be able to:

- Research and critically analyse renewable energy emerging technologies via literature.
- Analyse and evaluate the opportunities and risks associated with emerging technologies and engineering innovations.
- Demonstrate an ability to synthesise engineering solutions to complex renewable energy problems using the methodologies associated with engineering design and systems engineering

- Develop the ability to work collegiately to create and disseminate a technical report to senior managers/executives

Indicative reading list

Reading lists can be found in Talis

Specific reading list for the module

International

This module is part of the MSc Renewable Energy program delivered at the Azerbaijan State Oil & Industry University in Baku, Azerbaijan.

Subject specific skills

Technology decision making

- Engineering innovation strategy, development, & evaluation
- Technology justification
- Innovation management

Transferable skills

- Team working
- Leadership
- Creativity & innovation
- Communication skills
- Adaptability
- Problem solving
- Decision making
- Time management
- Critical thinking
- Report writing

Study

Study time

Type	Required
Lectures	15 sessions of 1 hour (10%)
Tutorials	15 sessions of 1 hour (10%)
Total	150 hours

Type	Required
Online learning (scheduled sessions)	(0%)
Online learning (independent)	15 sessions of 1 hour (10%)
Private study	45 hours (30%)
Assessment	60 hours (40%)
Total	150 hours

Private study description

Students will explore the research methodologies and how they work and will explore the best route through the research of the emerging technology. the exploration of the research methodologies and emerging technologies can be completed individually or in groups.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A1

	Weighting	Study time	Eligible for self-certification
Assessment component			
Coursework 1 - Written report	50%	30 hours	Yes (extension)
A report which investigates, and evaluates the potential of a new or emerging renewable energy technology. The report will be related to a topic chosen by the student in consultation with the relevant academic and will also explore the feasibility of the new or emerging technology			
Reassessment component			
Coursework 1 - Written report - Resubmission			No
A report which investigates, and evaluates the potential of a new or emerging renewable energy technology. The report will be related to a topic chosen by the student in consultation with the relevant academic and will also explore the feasibility of the new or emerging technology			

	Weighting	Study time	Eligible for self-certification
Assessment component			
Coursework 2 - Technical Proposal	50%	30 hours	No
The students will typically work in groups of 4 to create a technical report on an emerging technology which will be supported by a formative dissemination event. The assessment will include the statutory peer assessment process			
Reassessment component			
Resubmission Assessment			No
A written report focused on emerging technology within the renewable energy sector and the processes to review the validity of the relevant emerging technology			

Feedback on assessment

Verbal feedback given during seminars and individual tutorial sessions.

Availability

There is currently no information about the courses for which this module is core or optional.