

## Liverpool John Moores University

Title: ALTERNATIVE ENERGY SYSTEMS  
Status: Definitive  
Code: **7027MAR** (115971)  
Version Start Date: 01-08-2012

Owning School/Faculty: Engineering  
Teaching School/Faculty: Engineering

Team	Leader
Geraint Phylip-Jones	Y

**Academic Level:** FHEQ7  
**Credit Value:** 10.00  
**Total Delivered Hours:** 52.00  
**Total Learning Hours:** 100  
**Private Study:** 48

### Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	24.000
Off Site	16.000
Tutorial	12.000

**Grading Basis:** 50 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	AS1	Coursework - Essay	80.0	
Presentation	AS2	Coursework - Individual Presentation	20.0	

### Aims

*The aim of this module is to provide a comprehensive introduction to alternative power generation systems. The module will review the environmental issues surrounding existing methods of power generation and concentrate alternative and renewable sources.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Critically evaluate the issue of global warming within the context of power generation.
- 2 Analyse wind data and determine yield capacity of various types of wind turbines.
- 3 Design and evaluate the performance of a domestic solar thermal system by simulation.
- 4 Design and evaluate the performance of a photo voltaic generation system by simulation.
- 5 Discuss in detail alternative designs of nuclear power stations and associated environmental and safety issues.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Essay	1	2	3	4	5
Individual presentation	1	2			

## Outline Syllabus

*Evaluate the issues and mechanism of global warming, including the UK's policy on renewable energy.*

*Wind turbine - types, design, wind data collection/analysis, energy yield prediction.*

*Solar energy quantification and data collection/analysis.*

*Design of solar thermal systems and evaluate performance by simulation.*

*Design of P-V power systems and evaluate performance characteristics by simulation.*

*Review UK national grid power distribution system and discuss connection issues.*

*Investigate UK energy pricing structure.*

*Review of the UK nuclear energy industry.*

## Learning Activities

Formal lectures supported by tutorials, field visits and coursework.

## References

<b>Course Material</b>	Book
<b>Author</b>	Boyle G
<b>Publishing Year</b>	2004
<b>Title</b>	Renewable Energy - Power for a Sustainable Future
<b>Subtitle</b>	

<b>Edition</b>	2nd Edition
<b>Publisher</b>	Oxford University Press
<b>ISBN</b>	0-19-926178-4

<b>Course Material</b>	Book
<b>Author</b>	Boyle G, Everett B, Ramage J
<b>Publishing Year</b>	2003
<b>Title</b>	Energy Systems and Sustainability - Power for a Sustainable Future
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Oxford University Press
<b>ISBN</b>	0-19-926179-2

<b>Course Material</b>	Book
<b>Author</b>	Manwell J F, McGowan J G, Rogers A L
<b>Publishing Year</b>	2002
<b>Title</b>	Wind Energy Explained
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Wiley
<b>ISBN</b>	0-471-49972-2

<b>Course Material</b>	Book
<b>Author</b>	Twidell J, Weir T
<b>Publishing Year</b>	2006
<b>Title</b>	Renewable Energy Resources
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Taylor & Francis
<b>ISBN</b>	0-419-25330-0

<b>Course Material</b>	Book
<b>Author</b>	Gore A
<b>Publishing Year</b>	2006
<b>Title</b>	An Inconvenient Truth (DVD)
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Paramount
<b>ISBN</b>	0-144-3792653-1

<b>Course Material</b>	Book
<b>Author</b>	Hore-Lacy
<b>Publishing Year</b>	2006
<b>Title</b>	Nuclear Energy for the 21st Century
<b>Subtitle</b>	
<b>Edition</b>	

<b>Publisher</b>	World Nuclear University Press
<b>ISBN</b>	978-0123736222

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### **Notes**

This module principally aims to provide a relatively detailed insight into the spectrum alternative methods of power generation including associated issues such as global warming and connecting to the national grid system.