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| 800x300.jpg | **Course Title:** | Energy Technologies: Current Issues and Future Directions |
| **College:** | Physical Sciences |
| **School:** | Engineering |
| **Discipline:** | Oil & Gas Engineering  Renewable Energy |
| **Programme Level:** | Master of Science |
| **Date of Issue:** | September 2013 |

**Course Code(s)**

EG5066

**Credits**

15 credits will be awarded upon passing this course.

**Programmes for which this Course is a Pre-Requisite**

MSc Renewable Energy and MSc Oil & Gas Engineering

**Pre-Requisites**

None

**Aims of Course**

To gain an understanding of the current and future energy industries, the drivers for change, future energy supply-demand relations and the technical challenges in meeting the demand in a low carbon economy.

**Description of Course**

This course examines the energy industries including resources, supply-demand relationships, technologies, economic & environmental issues and challenges facing the industries. Drivers for change and a potential low carbon future will be considered in terms of the energy landscape in 2050.

**Learning Outcomes**

By the end of the course students should have:

**A: General knowledge and understanding of:**

* The different sources of energy and their utilization by sector
* Energy supply-demand relations by source
* Explain the drive towards a low carbon economy
* The technical challenges facing the energy industries
* The new and emerging energy technologies

**B: Gained intellectual skill so that they are able to:**

* Discuss and explain the sources of energy and the energy industries
* Describe and discuss the challenges facing the energy industries and their potential solutions
* Discuss and describe a future energy landscape

**C: Gained practical skills so that they are able to:**

* Evaluate different sources of energy
* Quantify the energy potential (heat, power and transport) from different sources of energy

**D: Gained or improved transferable skills so that they are able to:**

* Communicate in writing to technical experts and the wider public
* Demonstrate advanced reasoning skills
* Present complex information in an intelligible fashion

**Syllabus**

* Overview of the energy industries and their deployment
* Economic, environmental and legislative drivers impacting on the energy industries
* Oil: reserves, production, consumption, technologies & challenges
* Gas: reserves, production, consumption, technologies & challenges
* Coal: reserves, production, consumption, technologies & challenges
* Nuclear: reserves, production, consumption, technologies & challenges
* Hydro: reserves, production, consumption, technologies & challenges
* Wind: reserves, production, consumption, technologies & challenges
* Renewables: potential resources, technologies & challenges
* Synthetic fuels
* The future energy landscape

**Mode of Delivery**

This course is delivered as a full-time (on-campus) option. 2 one hour lectures per week and 1 one hour tutorial.

**Assessment Details**

Two hour written examination (60%)

Continuous assessment (40%) based on an individual written submission (20%) and a group project presentation (20%)

**Indicative Student Workload**

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| **Contact Hours** | **Full Time** | **Distance Learning** |
| Lectures | 24 |  |
| Tutorials | 12 |  |
| Assessment |  |  |
| **Directed Study** |  |  |
| Coursework |  |  |
| **Self Learning** |  |  |
| Private Study | 114 |  |
| Self-directed study of online materials |  |  |
| Online Activities |  |  |

**Recommended Reading**

G Boyle, B Everett & J Ramage (2003). Energy systems and sustainability. Oxford University Press.

D JC MacKay (2009). Sustainable energy – without hot air. UIT Cambridge. Available free at http://www.withouthotair.com