Liverpool John Moores University

Title:	ENERGY MANAGEMENT
Status:	Definitive
Code:	**7007BEPG** (102416)
Version Start Date:	01-08-2021
Owning School/Faculty:	Civil Engineering and Built Environment
Teaching School/Faculty:	Civil Engineering and Built Environment

Team	Leader
Mawada Abdellatif	Y
Joseph Amoako-Attah	

Academic Level:	FHEQ7	**Credit Value:**	20	**Total Delivered Hours:**	53
Total Learning Hours:	200	**Private Study:**	147		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24
Practical	2
Tutorial	24

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	unseen	40	3
Presentation	AS2	presentation	30	
Report	AS3	report	30	

Aims

To provide the necessary skills for the selection and the effective management of energy in the construction industry, business environment and the energy supply sector.

Learning Outcomes

After completing the module the student should be able to:

1	Critically appraise the existing procedures for energy management and energy source selection, and suggest improvements
2	Design and critically evaluate carbon neutral and low carbon construction and energy supply.
3	Critically evaluate the existing financial framework for energy systems.
4	Design and critically evaluate a sustainable energy system

Learning Outcomes of Assessments

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

EXAM	1	2
PRESENTATION	4	
REPORT	3	

Outline Syllabus

Energy use, range of electricity sources used, applications of energy
Design and critical evaluation of conventional energy sources: Primary and secondary fuel sources. Fossil fuels. Design and critical evaluation of methods of control of pollution from energy supply sources.
Electricity generation. Process efficiency, transmission losses, economic and environmental considerations.
Renewable energy sources: Solar radiation - photovoltaics, solar collectors and passive solar heating. Biomass. Refuse use. Gasification, anaerobic digestion, landfill gas. Energy crops. Hydroelectricity and tidal power. Wave energy. Wind energy. Geothermal energy and ground source energy. OTEC. Sizing of schemes and choice of options. Design and critical assessment of the Civil Engineering works needed for each.
Energy management; Objectives and strategies. Energy audits. Efficiency. Insulation.
Energy tariff selection. Plant control optimisation, energy management systems. Transport.
Carbon neutral and sustainable construction.
Calculations of embodied energy and energy pay back period. Economic assessment of energy supply and financial risk.
Legal and institutional framework governing energy and its use. International, EU and UK policy, law and regulation governing energy and its uses, and its impact on the environment. Targets, incentives and competition.

Learning Activities

Lectures, tutorials and practicals.

Notes

The module develops the students' ability to undertake a comprehensive review of energy supply, use and efficiency measures, to enable the student to make informed decisions on energy use in the construction industry and business.