ENGY C4F01: Sustainable Energy

Module Title:	Sustainable Energy
Language of Instruction:	English

Credits:	10

NFQ Level:	8

Module Delivered In	2 programme(s)

Module Aim:	The aim of this module is to exercise judgement in appraisal of projects and operations; with specific emphasis on energy management and conservation.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Analyse the theory and principles behind the current new energy efficient technologies, and the emerging SMART technologies the the potential opportunities that may develop.
LO2	Evaluate facilities for potential energy savings projects.
LO3	Carry out energy audits of industrial & commercial facilities and produce professional reports with recommendations.
LO4	Develop a structured approach to Energy Management: EN 50001(IS 393) S.E.A.I. E MAP process
LO5	Design and analyse industrial processes for drying, concentrating, heating and cooling of solids, fluids and mixtures.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

ENGY C4F01: Sustainable Energy

Module Content & Assessment

Indicative Content
New Green Energy Technologies Biomass, production systems, sustainability and energy conversion. Wind Power, evaluation of site-wind energy potential, wind farm planning, and layouts. Selection of turbines, Gate connection and control type. Biofuels Fuel Cell technology. Gasification, and waste to energy hierarchy. Marine Current Turbines (MCT) design and development.
Industrial Energy Auditing Electrical load profile analysis and opportunity for cost reduction from tariff structure. Reviewing Max Demand ,M.I.C.
Air Conditioning Psychrometric properties of humid air, Air conditioning processes: - Mixing, - Sensible heating, - Sensible cooling, - Humidification, - Dehumidification Air conditioning systems.
Process Heating and Drying Heating Technologies, Mechanical vapour recompression, Process drying, Steam heating system design.
Refrigeration & Cooling Chillers, Cooling towers.

Assessment Breakdown	%
Continuous Assessment	5.00%
Project	50.00%
End of Module Formal Examination	45.00%

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Psychrometrics	5	5.00	Week 5

Project

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Project	Industrial Energy Audit - following the EN standard for industrial auditing	2,3,4	15.00	End-of-Semester
Project	Wind Turbine	1,4	35.00	Week 7

No Practical

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	Questions based on the LO's 1,3,5	1,2,3,4,5	45.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

ENGY C4F01: Sustainable Energy

Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	12 Weeks per Stage	6.00
Laboratory	12 Weeks per Stage	2.00
Independent Learning	15 Weeks per Stage	10.27
	Total Hours	250.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EFARG_B	Bachelor of Engineering (Honours) in Agricultural Systems Engineering	8	Mandatory
CW_EMMEC_B	Bachelor of Engineering (Honours) in Mechanical Engineering	8	Mandatory