

No requirements listed

## ENGY H4007: Thermodynamics 2

Module Title:			Thermodynamics 2
Language of Instruction:		n:	English
Credits:		5	
NFQ Leve	l:	8	
Module D	elivered In		1 programme(s)
Module A	im:		To provide students with specialised knowledge of the processes associated with the generation and consumption of energy in engineering systems
Learning	Outcomes		
On succes	ssful completio	n of th	his module the learner should be able to:
LO1	Analyse thermal models of representative systems in order to determine the steady state performance of such systems		
LO2	Design, evaluate and predict the performance of heat exchangers.		
LO3	Assess the obligations and implications for industrial organisations with respect to environmental legislation, the Emission Trading System, Carbon Trading, Green House Gas (GHG) permits and Integrated Pollution Prevention Control (IPPC) Licensing.		
LO4	Quantify, b	by calc	culation and experimental measurement, the characteristics of thermal processes
	•		
Pre-requis	site learning		
	ecommendation learning (or		ctical skill) that is recommended before enrolment in this module.
No recomi	mendations list	ted	
	ible Modules modules whic	h hav	e learning outcomes that are too similar to the learning outcomes of this module.
No incomp	oatible modules	s liste	d
Co-requis	site Modules		
No Co-req	uisite modules	listed	1
Requirem This is prid		a prac	ctical skill) that is mandatory before enrolment in this module is allowed.



# ENGY H4007: Thermodynamics 2

### **Module Content & Assessment**

#### **Indicative Content**

Log Mean Temperature Difference, Heat exchanger design. Forced convection, Internal flow, External flow, Condensation.

#### **Project Evaluation**

Micro CHP (combined heat and power) units into commercial applications. Biomass project for a commercial facility ESCO (Energy Service Company) and energy supply contracts. Calculations, Primary Energy Sayings (PES), Carbon footprint, CO2 savings. Energy Map: Sustainable Energy Authority of Ireland (S.E.A.I.) Grant applications and project viability

#### **Environmental Impacts and Awareness**

Integrated Pollution Prevention Control (IPPC) Licensing GHG, Emission Trading Systems Legislative requirements for NOx, SOx, particulate emissions, Paris COP implications. Internalities associated with compliance with emission limit values using 'end-of-pipe Primary and secondary control measures.

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	30.00%
End of Module Formal Examination	60.00%

Continuous Assessment					
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date	
Examination	Class Test	1,2	10.00	Week 5	

No Project

Practical				
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Heat Exchanger Design	1,2,4	10.00	Week 8
Practical/Skills Evaluation	Labs: Air in a condenser, Crossflow Heat Exchanger. Report & Assessment	1,2,4	20.00	Week 11

End of Module Formal Examination					
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date	
Formal Exam	n/a	1,2,3	60.00	End-of-Semester	

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



## ENGY H4007: Thermodynamics 2

## Module Workload

Workload: Full Time		
Workload Type	Frequency	Average Weekly Learner Workload
Lecture	12 Weeks per Stage	4.00
Laboratory	12 Weeks per Stage	1.00
Independent Learning	15 Weeks per Stage	4.33
	Total Hours	125.00

## Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EMMEC_B	Bachelor of Engineering (Honours) in Mechanical Engineering	7	Mandatory