MODULE DESCRIPTOR

Module Title

Thermofluids 2

Reference	EN2702	Version	9
Created	March 2023	SCQF Level	SCQF 8
Approved	March 2004	SCQF Points	15
Amended	August 2023	ECTS Points	7.5

Aims of Module

The aim of this module is to provide the student with the ability to integrate the principles of classical thermodynamics and fluid mechanics in order to provide a foundation for the subsequent analysis of industrial plant and process equipment.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Practice effective use of the Laws of Thermodynamics in steady-state energy systems.
2	Show an understanding of gas and vapour power processes and cycles.
3	Practice effective use of fluid dynamics equations in incompressible fluids in flow systems.
4	Show an understanding of frictional losses in fluid transmission systems.
5	Report key findings from experiments involving thermofluids laws.

Indicative Module Content

Units and dimensions. 1st and 2nd Law of Thermodynamics, Reversible and Irreversible processes, Entropy. Heat Engine: Carnot cycle, Rankine cycle, Air Standard cycle, Otto cycle, Diesel cycle. Hydrodynamics, pressure distribution in fluids; Bernoulli's equation and flow through orifices, jets, Venturis, etc. Flow measurement. The momentum equation for flowing fluids; application to jet reaction, forces on bends, fixed and moving vanes; fluid machinery. Flow in pipe, reynolds' experiments, laminar and turbulent flow, pipe wall friction, friction factor, pipe wall roughness, flow in pipe systems, pipe design. Boundary layer theory.

Module Delivery

This module will be delivered by means of lectures and tutorials with integrated laboratory work.

Module Ref:	EN2702 v9

Indicative Student Workload	Full Time	Part Time
Contact Hours	50	50
Non-Contact Hours	100	100
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	30%	Outcomes Assessed:	5
Description:	Laboratory report.				

Component 2

Type:	Examination	Weighting:	70%	Outcomes Assessed:	1, 2, 3, 4
Description:	Closed book examination.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 (y-axis) is worth 30% and C2 (x-axis) is worth 70%.

Examination:

	Coursework: A	B	C	D	E	F	NS
A	A	A	B	B	E	E	
B	B	B	B	C	E	E	
C	B	C	C	C	E	E	
D	C	C	D	D	E	E	
E	E	E	E	E	E	F	
F	F	F	F	F	F	F	

NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	Thermofluids 1 (EN1702) or its equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	CLIFFORD, M., et al. 2009. An Introduction to Mechanical Engineering Part 1. London: Hodder Education.
2	EASTOP, T.D. and McCONKEY, A., 1993. Applied Thermodynamics for Engineering Technologists. 5th ed. Harlow: Longman.