MODULE SPECIFICATION

Part 1: Information			
Module Title	Thermofluid Systems		
Module Code	UFMFTA-15-3	Level	Level 6
For implementation from	2022-23		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Module type:	Standard		
Pre-requisites	Heat Transfer, Power and the Environment 2022-23		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: Fluid flow (both liquid and gas) and heat flow are two most common processes that occur together in a vast array of industrial applications and these two processes have a significant impact on many other engineering processes too.

Thermofluid Systems module advances the understanding of combined fluid flow and heat flow and the underpinning physics, covering a good range of practical industrial applications in both mechanical engineering and in building services engineering. In class demonstrations and videos will enhance the learning experience.

Educational Aims: The aim of this module is for students to be able to apply thermofluid concepts to the design and solution of industry relevant practical problems in both mechanical engineering and in building services engineering.

Outline Syllabus: Refrigeration (vapour compression and vapour absorption), multi-stage refrigeration, primary and secondary refrigerants, energy requirements, heat pumps.

Air conditioning, psychrometry, mixing of air-streams, designing of air conditioning systems, calculating heating and cooling loads.

Advanced gas turbine and steam turbine cycles, combined heat and power (CHP), energy recovery.

Compressible flow machines (fans, compressors), radial and axial flow machines, limitations of design process, improving existing designs.

Inompressible flow machines (Pumps), selection of pumps, operational issues, limitations of design process, improving existing designs.

Teaching and Learning Methods: Large group lecture supported by small group tutorial sessions. Additional laboratory demonstrations may be used to illustrate certain points. This material may be provided as video or likewise if student numbers are too high for laboratory visits. Study time outside of contact hours will be spent on going through exercises and example problems.

Part 3: Assessment

Assessed by a single three hour end of module examination which focuses on scenarios requiring the application of advanced analytical techniques for critically assessing the design and performance of thermofluid industrial processes.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	100 %	Examination (3 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	100 %	Examination (3 hours)

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	**Reference**
Critically analyse processes involving refrigeration, air-conditioning, fluid machinery and advanced power cycles with reference to fundamental operating principles (EA1m)	MO1
Demonstrate a fundamental knowledge of equipment and working fluids used in refrigeration, air-conditioning, fluid machinery and advanced power cycles. (P2)	MO2
Select and apply models and computational techniques to the analysis and solution of problems involving thermofluid systems. (EA3m)	MO3
Describe and explain the principles that govern the operation of refrigeration, air conditioning, heating and ventilation systems with reference to limitations of current practice (P9m)	MO4
Use a system approach, energy usage and cost drivers for the selection of thermofluid systems. (SM3m)	MO5

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36

	Total Scheduled Learning and Teaching Hours:	36
	Hours to be allocated	150
	Allocated Hours	150
Reading List	*The reading list for this module can be accessed via the following link:* https://uwe.rl.talis.com/modules/ufmfta-15-3.html	

Part 5: Contributes Towards
This module contributes towards the following programmes of study: Mechanical Engineering {Apprenticeship} [Sep][PT][Frenchay][6yrs] BEng 2018-19 Mechanical Engineering [Sep][PT][Frenchay][7yrs] MEng 2018-19 Mechanical Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng 2018-19 Mechanical Engineering {Foundation} [Sep][SW][Frenchay][6yrs] MEng 2018-19 Mechanical Engineering [Sep][PT][Frenchay][6yrs] BEng 2018-19 Mechanical Engineering [Sep][PT][COBC][6yrs] BEng 2018-19