MODULE SPECIFICATION

Part 1: Information			
Module Title	Advanced Heat Transfer		
Module Code	UFMF7T-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 Engineering Design & Mathematics		
Module Type:	Standard		
Pre-requisites	Applied Thermofluids 2021-22		
Excluded Combinations	None		
Co-requisites	None		
Module Entry Requirements	None		
PSRB Requirements	None		

Part 2: Description

Overview: Building on previous Thermofluids work this module will enable students to understand the importance of heat transfer when analysing energy consumption in complex systems.

Fundamental phenomena will be explored both theoretically and through a range of experimental work.

Incorporating a section on thermography the potential of this non-destructive testing technique will be explored using industry standard equipment and software.

Educational Aims: To develop a detailed understanding of real world heat transfer applications. The module will include an introduction to the use of industry standard thermography equipment.

Outline Syllabus: Introduction to Thermography
1-D Heat Transfer in pipes, slabs and cylinders
Forced Convection
Heat Exchangers
Natural Convection

Steady State Conduction in 2/3 Dimensions
Extended Surfaces
Transient Heat Transfer
Radiation

Teaching and Learning Methods: Interactive lectures using formative feedback.
Hands-on laboratory experiments and computer modelling designed to promote self-learning
Self paced peer assisted work groups

Part 3: Assessment

The exam will be based on a strategy that will ensure that students are able to demonstrate and apply their knowledge and understanding through engagement with problems and scenarios encountered throughout the module.

Specifically questions will be based on data obtained from experiments conducted independently in laboratory work throughout the module alongside some traditional questions.

Small amount of marks are allocated for the data collection. Students who have not collected will have data provided to them in the examination assessment.

Resit assessment strategy is a written examination

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	100 %	Via controlled conditions using group data obtained from experiments conducted independently throughout the Semester alongside some traditional questions. Open book exam to demonstrate ability to understand, analyse and apply knowledge and think critically (3 hours).
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	100 %	Via controlled conditions using group data obtained from experiments conducted independently throughout the Semester alongside some traditional questions. Open book exam to demonstrate ability to understand, analyse and apply knowledge and think critically (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**
Acquire the ability to apply and integrate thermographical knowledge, whilst understanding its limitations, to heat transfer applications (SM3m)	MO1
Develop an understanding of the thermal characteristics of materials and their impact on heat transfer processes (P2)	MO2

	Demonstrate the ability to apply different quantitative and computational methods to complex heat transfer problems and understand the limitations and impact of the solution (EA3m)	MO3
	Be able to work with information that may be incomplete or uncertain and to quantify the effect of this on the application. Where appropriate use heat transfer theory or experimental research to mitigate deficiencies (D3m)	MO4
	Apply advanced heat transfer knowledge to engineering processes (EA1m)	MO5

Contact Hours	**Scheduled Learning and Teaching Hours:**	
	Laboratory work	8
	Lectorials	24
	Tutorials	12
	Total Scheduled Learning and Teaching Hours:	44
	Hours to be allocated	150
	Allocated Hours	44
Reading List	*The reading list for this module can be accessed via the following link:* https://rl.talis.com/3/uwe/lists/AADEF5FB-C74D-47C5-7D5E-F571D16C277F.html?lang=en-GB&login=1	

Part 5: Contributes Towards
This module contributes towards the following programmes of study: Mechanical Engineering MEng 2020-21