



Module Specification

Thermodynamics and Fluid Dynamics

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Part 1: Information

Module title: Thermodynamics and Fluid Dynamics

Module code: UFME79-15-2

Level: Level 5

For implementation from: 2024-25

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: University Centre Weston

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: Fundamentals of Engineering Mathematics and Modelling 2023-24

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: The principles governing the flow of fluids and fluid dynamics are an essential part of an engineer's knowledge base, enabling them to design, solve and maintain a variety of problems that occur throughout engineering such as the design of efficient pumping systems, processing plant and heat exchange technologies. The approach taken is to make sure that theory is underpinned by experiment and observation so that students can properly understand the mechanisms at work. The module is designed to provide a solid foundation of knowledge, with practical

exercises that reinforce and will enable the extension to specialist knowledge in future years.

Features: Not applicable

Educational aims: Aim of this module is to introduce thermodynamics, heat transfer and fluid dynamics which provides an underpinning of fundamental scientific methods and engineering applications.

Outline syllabus: The laws of Thermodynamics

Systems, Energy, Processes, Properties and Thermodynamic Property Relationships

Non-Flow Energy Equation (NFEE)

Gas Laws

Non-flow Vapour Processes

Basic Heat Transfer

Hydrostatics and Buoyancy

Dimensional Analysis

Technical/statistical uncertainty

Incompressible flow

Steady-Flow Energy Equation (SFEE)

Part 3: Teaching and learning methods

Teaching and learning methods: Teaching and learning methods will involve interactive lectures with formative feedback, hands-on laboratory experiments designed to promote self-learning and self-paced peer assisted work groups

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

MO1 Describe and explain thermofluid principles and the associated methodology necessary to underpin, and enable appreciation of, relevant engineering applications

MO2 Apply practical and laboratory skills relevant to thermofluid processes

MO3 Demonstrate the ability to work with experimental technical uncertainty in a laboratory environment

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 30 hours

Total = 150

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link

Part 4: Assessment

Assessment strategy: The assessment strategy is designed to integrate physical principles and concepts with experiments and applications. There are two assessment.

Assessment 1 (50%) is a Laboratory report that links experimental methods with theoretical analysis .

Assessment 2 (50%) is an end-of-term examination to assess learners on their thermodynamic and fluid dynamic knowledge and topics covered.

The resit assessment takes the same form as the first sit assessment.

Assessment tasks:

Laboratory Report (First Sit)

Description: Laboratory Report on fluid and thermodynamic processes (1500 words)

Weighting: 60 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3

Examination (Online) (First Sit)

Description: 4 hour online examination.

Weighting: 40 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1

Laboratory Report (Resit)

Description: Laboratory Report on fluid and thermodynamic processes (1500 words)

Weighting: 60 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3

Examination (Online) (Resit)

Description: 4 hour online examination.

Weighting: 40 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electro-mechanical Engineering {Apprenticeship-UCW}[UCW] BEng (Hons) 2023-24