



Module Specification

Thermofluidic Dynamics

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Part 1: Information

Module title: Thermofluidic Dynamics

Module code: UFMFTP-30-1

Level: Level 4

For implementation from: 2023-24

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: Not applicable

Features: Not applicable

Educational aims: In this module learners will develop their mathematical analysis, practical and professional skills. It will cover fundamental concepts of thermal fluid dynamics and steam power generating plant.

Outline syllabus: Thermofluidic Dynamics investigates the ideal gas laws and energy that is related to the flow of fluids and looks at the mathematical model of both. It analyses fluid networks to be able to identify the causes and remedies of pressure losses. The module also evaluates fluid machines and two phase flow.

Topic covered in this module:

Thermodynamics:

Fundamentals

Conservation of Energy and Mass

Thermodynamic Laws

Fluid Networks

Flow Measurement

Sheer Stress & Rate

Laminar and Turbulent Flow

Pressure Losses

Fluid Machines

Flow:

Void Fractions

Steam Quality

Flow Patterns

Pressure Losses

In this module the following mathematical concepts will be introduced and developed:

Dimensions and Physical Quantities

Differentiation

Integration

Numerical Methods

Using Matlab

Programming Structures

Part 3: Teaching and learning methods

Teaching and learning methods: See Assessment and Outline Syllabus

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

MO1 Conduct flow energy and ideal gas system calculations

MO2 Explain the causes and remedies of pressure losses in fluid networks.

MO3 Analyse the use of fluid machines in flow networks.

MO4 Propose and justify improvements to in-service thermofluidic systems.

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Face-to-face learning = 72 hours

Total = 300

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/index.html) via the following link <https://uwe.rl.talis.com/index.html>

Part 4: Assessment

Assessment strategy: Multiple Choice Exam – 90 minutes – This exam will assess the learners' understanding of core concepts of Fluid and Thermodynamics. It will also assess the learners' mathematical analysis skills of fluid and thermodynamics calculations.

Reflective Review – This portfolio will assess learners' ability to explain the causes of

and solutions to pressure losses in a system. Learners must also analyse the different fluid machines and flow. The students must capture workshop based evidence and then provide a reflective review of the evidence to justify proposals for improvement to in-service thermofluidic systems.

The resit assessment tasks match the first sit requirements.

Assessment tasks:

Examination (First Sit)

Description: Multiple Choice (90 minutes)

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1

Portfolio (First Sit)

Description: Evidence of undertaking practicals and reflective review

Weighting: 75 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2, MO3, MO4

Examination (Resit)

Description: Multiple Choice (90 minutes)

Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

Portfolio (Resit)

Description: Evidence of undertaking practicals and reflective review

Weighting: 75 %

Final assessment: No

Group work: No

Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [UCS] BEng (Hons)
2023-24

Mechanical Engineering with Nuclear [UCS] BEng (Hons) 2023-24

Electromechanical Engineering (Nuclear) {Apprenticeship-UCS} [UCS] FdSc 2023-
24

Electromechanical Engineering (Nuclear) [UCS] FdSc 2023-24

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS}
[UCS] BEng (Hons) 2023-24

Electrical, Electronic and Control Engineering with Nuclear [UCS] BEng (Hons)
2023-24

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS}
[UCS] BEng (Hons) 2022-23

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [UCS] BEng (Hons)
2022-23