Module Specification

Thermofluidic Dynamics

Version: 2019-20, v1.0, 22 Jul 2019

Contents

Part 1: Information

Module title: Thermofluidic Dynamics

Module code: UFMFTP-30-1

Level: Level 4

For implementation from: 2019-20

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Delivery locations: University Centre Somerset

Field: Engineering, Design and Mathematics

Module type: Standard

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 via the following link https://uwe.rl.talis.com/index.html

Part 4: Assessment

Assessment strategy: Component A – 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.

Component B – 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 for this module will involve a rework and reflective evaluation of the work carried out in the original task.

Assessment components:

Portfolio - Component B (First Sit)
Description: Reflective review
Weighting: 75 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3, MO4

Examination - Component A (First Sit)
Description: Multiple Choice (90 minutes)
Weighting: 25 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1

Portfolio - Component B (Resit)
Description: Reflective review
Weighting: 75 %
Final assessment: No
Group work: No
Learning outcomes tested:

Examination - Component A (Resit)
Description: Multiple Choice (90 minutes)
Weighting: 25 %

Final assessment: Yes

Group work: No

Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS} [Sep][FT][UCS][4yrs] BEng (Hons) 2019-20

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [Sep][FT][UCS][4yrs] BEng (Hons) 2019-20

Electromechanical Engineering (Nuclear) {Apprenticeship-UCS} [Sep][FT][UCS][3yrs] FdSc 2019-20

Electrical, Electronic and Control Engineering with Nuclear {Apprenticeship-UCS} [Sep][FT][UCS][5yrs] BEng (Hons) 2018-19

Mechanical Engineering with Nuclear {Apprenticeship-UCS} [Sep][FT][UCS][5yrs] BEng (Hons) 2018-19