



Module Specification

Energy and Thermodynamics

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Part 1: Information

Module title: Energy and Thermodynamics

Module code: UFMFF3-15-1

Level: Level 4

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Delivery locations: City of Bristol College, Frenchay Campus, Global College of Engineering and Technology (GCET), National Economics University Vietnam, University Centre Somerset, University Centre Weston

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: The study of thermodynamics forms one of the disciplines that underpin many areas of engineering. This module is designed to provide a solid foundation of knowledge which will be used to extend specialist knowledge in future years.

Outline syllabus: Concepts of pressure and temperature, work, heat and energy, absolute temperature and pressure.

Concepts of total and specific energy etc; notation; units; problem solving.

Closed Systems; analysis of closed systems; internal energy, the NFEE.

Work producing processes, process laws, work equations.

Open systems; analysis of open systems; the SFEE and continuity.

Properties of ideal gases, gas laws, property relations.

Problems involving gases.

Water and Steam; phase change; definitions of state; use of Steam Tables; properties of 2-phase mixture.

Problems involving water and steam.

Entropy; pV and TS diagrams.

Power Cycles: Otto, Brayton, Rankine.

Part 3: Teaching and learning methods

Teaching and learning methods: Large group lecture supported by small group tutorial sessions. Study time outside of contact hours will be spent on going through

exercises and example problems.

Scheduled learning includes lectures and tutorials.

Independent learning includes hours engaged with essential reading, exercise preparation and completion etc.

Hours

Contact: 36

Assimilation and skill development: 70

Coursework preparation: 0

Exam preparation: 44

Total: 150

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

MO1 Use specialist engineering knowledge and understanding of key principles and results in thermodynamics

MO2 Apply appropriate theoretical methods to the analysis of problems in thermodynamics, based on knowledge of the relevant engineering principles

MO3 Show cognitive skills with respect to modelling and simplifying real problems in thermodynamics, and applying mathematical methods of analysis

MO4 Apply appropriate theoretical and practical methods in problem formulation and decision-making, interpreting experimental results

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/ufmff3-15-1.html) via the following link <https://uwe.rl.talis.com/modules/ufmff3-15-1.html>

Part 4: Assessment

Assessment strategy: Assessed via end of semester Exam 3 hours (100%) to include sufficient time for students to read and assimilate associated data sheets. Summative assessment.

Formative assessment (not contributing to module mark) is provided via support in tutorials.

Assessment components:

Examination (Online) (First Sit)

Description: Online Examination (3 hours)

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Online) (Resit)

Description: Online Examination (3 hours)

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechanical Engineering [UCS] FdSc 2023-24

Mechanical Engineering and Technology (Manufacturing) {Foundation} [GCET]

BEng (Hons) 2022-23

Mechanical Engineering and Technology (Vehicle Technology) {Foundation} [GCET]

BEng (Hons) 2022-23

Mechanical Engineering and Technology {Foundation} [GCET] BEng (Hons) 2022-23

Energy Technology and Management {Foundation} [GCET] BSc (Hons) 2022-23

Mechanical Engineering [Gloscoll] FdSc 2022-23