Module Specification

Further Aero-Propulsion

Version: 2023-24, v2.0, 06 Jul 2023

Contents

Part 1: Information

Module title: Further Aero-Propulsion

Module code: UFMFYU-15-3

Level: Level 6

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

Field:

Module type: Module

Pre-requisites: Fundamental Aero-Propulsion 2022-23

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: The module provides further and more advanced knowledge and understanding of the thermodynamics and engine performance through components analysis.

The main focus is on the engineering design and analysis of components in the main gas path, i.e. compressor, combustion chamber, and turbine as well as further emphasis on nozzles and diffusers, and related emerging technologies.

Features: Not applicable

Educational aims: to [The aim of this module is to provide advanced technical underpinning in thermodynamics applied to engine design and performance.

Outline syllabus: Indicative curriculum:

Combustor and combustion physics

Turbomachinery (Euler Turbine Equation, Velocity Triangle,
Compressors, Turbines)
Blades interaction

Blade cooling

Other components (diffusers, nozzles, etc.)

Introduction to electric propulsion

Part 3: Teaching and learning methods

Teaching and learning methods: In order to ensure secure knowledge of technical content that is then applied in context, the module will combine lectures and lectorials to learn concepts and principles, as well as practicals to allow students to experience working on real engineering challenges.

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

MO1 Assess engine performance at component level by applying appropriate knowledge of aerodynamics and thermodynamics. (SM3b, EA2, P2)

MO2 Model the aero-thermo flow physics on engine components through analytical or numerical methods. (EA3b, EA4b, P3)

MO3 Develop appropriate design solution at engine component level within various constraints and limitations. (D3b, P4, P8)

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Laboratory work = 12 hours

Total = 150

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: The module will be assessed as follows:

An end-of-semester exams to assess mathematical competencies in an engineering context as well as fundamental understanding of various aspects of gas turbine engine performance.

A group project involving the use of simulation and modelling tools will be used to expose the students to modern methodological approaches and real engineering problems. Submission of presentation slides with supporting work files and a 30 minute group presentation including Q/A.

A peer review process will be used to moderate the group work mark in accordance with Department's Group Work Policy.

Resit is the same as the first sit

Resit deliverable(s) will be scaled appropriately to group size and task complexity

Assessment tasks:

Examination (First Sit)
Description: Written examination (2 hours)

Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2

Presentation (First Sit)
Description: 30 minute group presentation including Q/A.
Weighting: 50 %
Final assessment: No
Group work: Yes
Learning outcomes tested: MO2, MO3

Examination (Resit)
Description: Written examination (2 hours)
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2

Presentation (Resit)
Description: 30 minute group presentation including Q/A.

Resit deliverable(s) will be scaled appropriately to group size and task complexity
Weighting: 50 %
Final assessment: No
Group work: Yes
Learning outcomes tested: MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Aerospace Engineering {Apprenticeship-UCW} [Sep][FT][UCW][4yrs] BEng (Hons) 2020-21

Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2021-22

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2021-22

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Aerospace Engineering {Apprenticeship-UWE} [Sep][FT][UCW][4yrs] BEng (Hons) 2021-22

Aerospace Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2020-21

Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2020-21

Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][5yrs] MEng 2020-21

Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21