Module Specification

Mechanics of Composites

Version: 2021-22, v1.0, 08 Oct 2019

Contents

Part 1: Information

Module title: Mechanics of Composites

Module code: UFMFVL-15-M

Level: Level 7

For implementation from: 2021-22

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: Frenchay Campus

Field: Engineering, Design and Mathematics

Module type: Standard

Pre-requisites: Stress Analysis 2021-22

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: See Learning Outcomes

Outline syllabus: Introduction to micro/macro mechanics of composite materials

Classical laminate theory

Strength of laminates

Failure criterions for laminates

Stability of composites (buckling)

Environmental effects (temperature and moisture)

Introduction to Finite Element Analysis: overview of FEA applications, nodes, elements, meshes, stiffness matrix, and boundary conditions - loads and restraints.

Practical Composite FE modelling techniques: e.g.: Planning, pre-processing, model solution, post processing, symmetry, convergence tests, boundary conditions, element types/selection, co-ordinate systems, mesh creation.

Part 3: Teaching and learning methods

Teaching and learning methods: This module is supported by computer practical sessions. Study time outside of contact hours will be spent on worked exercises and example problems.

Scheduled learning includes lectures, tutorials and computer practical sessions

Independent learning includes hours engaged with essential reading, software, assignment preparation and completion etc. These sessions constitute an average time per level as indicated in the table below.

There are a total of 36 scheduled contact hours for lecturing and tutorials:

Lectures/tutorials: 36 hours
Self-directed learning : 60 hours

Assessment preparation : 54 hours

Total hours : 150

Module Learning outcomes:

MO1 Design and undertake substantial investigations to address significant areas of theory and practice in structural modelling

MO2 Select appropriate advanced methodological approaches and critically evaluate their effectiveness

MO3 Apply appropriate theoretical and practical methods to the analysis and solution of engineering problems

MO4 Demonstrate and critically evaluate current theoretical and methodological approaches through use of professional literature

MO5 Act with initiative in decision-making within professional or given guidelines

MO6 Communicate effectively using professional engineering terms

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 via the following link https://uwe.rl.talis.com/modules/ufmfvl-15-m.html

Part 4: Assessment

Assessment strategy: The module is assessed using a technical report covering both theoretical concepts and practical implementation of finite element methods to engineering structural analysis problems.

The coursework is designed to assess modelling of Composite material using

commercial software packages as well as numerical calculation. There is a great emphasis in critically evaluating and analysing results and comparison between computational and theoretical methods. The output of this coursework will be a report in the style of a 10 page conference paper. A template will be provided to help students structure the report appropriately.

The referred coursework will involve a reworking of the first sit submission taking into account feedback to improve the quality of the work. In the event of any non-submission of coursework a new but equivalent task will be published.

Assessment components:

Report - Component A (First Sit)
Description: The coursework is designed to assess engineering modelling of Composite material using commercial Finite Element software packages as well as numerical calculation.

The output will be a report in the style of a 10 page conference paper (about 3000 words) . A template will be provided to help students structure the report appropriately.
Weighting: 100 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6

Report - Component A (Resit)
Description: The referred coursework will involve a reworking of the first sit submission taking into account feedback to improve the quality of the work. In the event of any non-submission of coursework a new but equivalent task will be published.

The output will be a report in the style of a 10 page conference paper (about 3000 words) . A template will be provided to help students structure the report appropriately.

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4, MO5, MO6

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Automotive Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19

Mechanical Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19