MODULE SPECIFICATION

Part 1: Information			
Module Title	Stress Analysis		
Module Code	UFMFQA-15-2	Level	Level 5
For implementation from	2019-20		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Module type:	Standard		
Pre-requisites	Stress & Dynamics 2019-20		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: One of the key disciplines that underpin mechanical engineering is introduced in this module and supported by practical laboratory exercises. This foundation of knowledge presented here will be used to extend specialist knowledge in future years.

Outline Syllabus: Stress Analysis:

Stress Concentration

Un-symmetric bending

Curved beams

Bending of composite beams

Torsion (non-circular cross sections)

Elementary elastic plastic analysis

Buckling of struts

Beams deflections

Mohr's Circle for stress and strain

Rosette analysis

Failure criteria for ductile and brittle materials

Experimental Stress Analysis:

Torsion (non-circular cross sections), Buckling of struts, Beams deflections, Rosette analysis, Un-symmetric bending, Curved beams

Teaching and Learning Methods: Large group lecture supported by small tutorials and laboratory sessions. Study time outside of contact hours will be spent on going through exercises and example problems.

Lab sessions (Group work) will provide experience of empirical methods and comparison with theoretical analysis

Scheduled learning includes lectures, tutorials and lab sessions.

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

Part 3: Assessment

Component A: Exam
Assessed via end of semester Exam (3 hours) to assess the students understanding of concepts and techniques.

Component B: Laboratory report and e-assessment
Assessed via end of semester report and a series of online e-assessment tests to encourage engagement and provide formative feedback.

For the lab report, students will work in groups to carry out a series of experiments.

Each student will write a detailed report on one of those experiments.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Online Assignment - Component B		6.25 %	Online tests
Laboratory Report - Component B		18.75 %	Lab report
Examination - Component A	✓	75 %	Exam (3 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Laboratory Report - Component B		25 %	Lab report
Examination - Component A	✓	75 %	Exam (3 Hrs)

Part 4: Teaching and Learning Methods

Learning Outcomes

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

Module Learning Outcomes	Reference
Show a detailed knowledge and understanding of theoretical and experimental Stress analysis and structural behaviour with regard to the standard engineering components and artefacts.	MO1
Demonstrate subject specific skills with respect to solving complex problems in the general stress analysis of realistic engineering components and understand the design principles involved.	MO2
Select, apply and evaluate advanced stress analysis techniques for a wide range of engineering problems.	MO3
Demonstrate a comprehensive understanding of analytical and experimental methods for the solution of strength and stiffness.	MO4
Demonstrate a comprehensive understanding of structures subjected to a variety of load types and be able to predict modes of failure.	MO5
Model and simplify real problems, and apply mathematical methods of analysis.	MO6

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36
Total Scheduled Learning and Teaching Hours:	36
Hours to be allocated	150
Allocated Hours	150

Reading List

The reading list for this module can be accessed via the following link:

https://uwe.rl.talis.com/modules/ufmfqa-15-2.html

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Mechanical Engineering (Mechatronics) {Top-Up} [Sep][FT][AustonSriLanka][1yr] BEng (Hons) 2019-20

Mechanical Engineering (Mechatronics) {Top-Up} [Sep][FT][AustonSingapore][1yr] BEng (Hons) 2019-20

Mechanical Engineering (Mechatronics) {Top-Up} [May][FT][AustonSriLanka][1yr] BEng (Hons) 2019-20

Mechanical Engineering (Mechatronics) {Top-Up} [Feb][FT][AustonSingapore][1yr] BEng (Hons) 2019-20

Mechanical Engineering (Mechatronics) {Top-Up} [Sep][PT][AustonSingapore][2yrs] BEng (Hons) 2019-20
Mechanical Engineering (Mechatronics) {Top-Up} [Feb][PT][AustonSingapore][2yrs] BEng (Hons) 2019-20
Mechanical Engineering (Mechatronics) {Top-Up} [May][PT][AustonSingapore][2yrs] BEng (Hons) 2019-20
Mechanical Engineering (Mechatronics) {Top-Up} [Sep][PT][AustonSriLanka][2yrs] BEng (Hons) 2019-20
Mechanical Engineering (Mechatronics) {Top-Up} [Feb][PT][AustonSriLanka][2yrs] BEng (Hons) 2019-20
Mechanical Engineering (Mechatronics) {Top-Up} [May][PT][AustonSriLanka][2yrs] BEng (Hons) 2019-20
Mechanical Engineering (Mechatronics) {Top-Up} [May][FT][AustonSingapore][1yr] BEng (Hons) 2019-20
Mechanical Engineering (Mechatronics) {Top-Up} [Feb][FT][AustonSriLanka][1yr] BEng (Hons) 2019-20
Mechanical Engineering with Manufacturing {Apprenticeship} [Sep][PT][Frenchay][4yrs] BEng (Hons) 2018-19
Mechanical Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19
Mechanical Engineering (Nuclear) - Not Running BEng (Hons) 2017-18
Mechanical Engineering [Sep][FT][BTC][2yrs] FdSc 2018-19
Mechanical Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19
Mechanical Engineering [Sep][FT][Frenchay][3yrs] BEng 2018-19
Mechanical Engineering [Sep][SW][Frenchay][4yrs] BEng 2018-19
Aerospace Engineering (Design) [Sep][SW][Frenchay][5yrs] MEng 2018-19
Aerospace Engineering with Pilot Studies (Design) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19
Aerospace Engineering with Pilot Studies (Design) [Sep][FT][Frenchay][4yrs] MEng 2018-19
Aerospace Engineering with Pilot Studies (Design) [Sep][SW][Frenchay][5yrs] MEng 2018-19
Aerospace Engineering (Design) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19
Aerospace Engineering (Design) [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19
Mechanical Engineering with Manufacturing [Sep][PT][Frenchay][4yrs] BEng (Hons) 2018-19
Mechanical Engineering with Manufacturing {Apprenticeship} [Sep][PT][UCW][4yrs] BEng (Hons) 2018-19
Mechanical Engineering with Manufacturing {Apprenticeship} [Sep][PT][COBC][4yrs] BEng (Hons) 2018-19
Mechanical Engineering with Manufacturing {Apprenticeship} [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19
Aerospace Engineering (Design) [Sep][FT][Frenchay][4yrs] MEng 2018-19
Aerospace Engineering with Pilot Studies (Design) [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19
Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][5yrs] MEng 2018-19
Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19
Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19
Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19
Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2018-19
Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19
Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19
Aerospace Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19
Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19
Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19