MODULE SPECIFICATION

Part 1: Information			
Module Title	Stress Analysis (PBL)		
Module Code	UFMFMP-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 integrated with practical laboratory exercises. This foundation of knowledge presented here will be used to extend specialist automotive knowledge in future years through application based learning.

Outline Syllabus: The syllabus includes:

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: The problem based learning strategy that is adopted in this module will introduce students to the design and operation of mechanical components in situ as component parts of an engineering system. This will motivate students to understand theoretical principles and concepts as practicing engineers. At the same time students need to be able to demonstrate understanding of the material and be able to apply the methods and techniques in a variety of contexts.

Part 3: Assessment

Component A:
Exam (75%) A 3 hour examination will assess a mixture of questions involving underlying principles and applications under controlled conditions. This will include an online/in-class test carrying a modest weighting (25%) to encourage engagement and focus on formative function supporting the delivery of the Project Based Coursework assessment.

Component B:
Project Based Coursework (25%) A portfolio of project based assessments that cover a range of tasks of approximately 2000 words or equivalent.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Project - Component B		25 %	A portfolio of project based assessments of 2000 words or equivalent
In-class test - Component A		19 %	Online tests
Examination - Component A	✓	56 %	Exam (3 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Project - Component B		25 %	A portfolio of project based assessments of 2000 words or equivalent
Examination - Component A	✓	75 %	Exam (3 hours)

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 solve complex problems in the general stress analysis of realistic engineering components and understand the design principles involved	MO2
Selecting, applying and evaluating 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 analyse structures subjected to a variety of load types and be able to predict modes of failure	MO5
Modelling and simplifying real problems, and applying mathematical methods of analysis	MO6
Demonstrate key transferable skills in problem formulation and decision making, interpreting experimental results	MO7

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/ufmfmp-15-2.html

Part 5: Contributes Towards
This module contributes towards the following programmes of study: Automotive Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19 Automotive Engineering [Sep][FT][Frenchay][4yrs] MEng 2018-19 Automotive Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19 Automotive Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19