



## MODULE SPECIFICATION

Part 1: Information			
Module Title	Stress Analysis (PBL)		
Module Code	UFMFMP-15-2	Level	Level 5
For implementation from	2020-21		
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 2020-21		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p><b>Educational Aims:</b> 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.</p> <p><b>Outline Syllabus:</b> The syllabus includes:</p> <ul style="list-style-type: none"> <li>Stress Analysis:</li> <li>Stress Concentration Un-symmetric bending</li> <li>Curved beams</li> <li>Bending of composite beams</li> <li>Torsion (non-circular cross sections)</li> <li>Elementary elastic plastic analysis</li> <li>Buckling of struts</li> <li>Beams deflections</li> <li>Mohr's Circle for stress and strain</li> <li>Rosette analysis</li> <li>Failure criteria for ductile and brittle materials</li> </ul>

## STUDENT AND ACADEMIC SERVICES

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:**

An examination will assess a mixture of questions involving underlying principles and applications under controlled conditions. This will include an online/in-class test to encourage engagement and focus on formative function supporting the delivery of the Project Based Coursework assessment.

**Component B:**

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

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<b>Part 4: Teaching and Learning Methods</b>																	
Learning Outcomes	<p>On successful completion of this module students will achieve the following learning outcomes:</p> <table border="1"> <thead> <tr> <th style="text-align: left;"><b>Module Learning Outcomes</b></th> <th style="text-align: left;"><b>Reference</b></th> </tr> </thead> <tbody> <tr> <td>Show a detailed knowledge and understanding of theoretical and experimental Stress analysis and structural behaviour with regard to the standard engineering components and artefacts</td> <td>MO1</td> </tr> <tr> <td>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</td> <td>MO2</td> </tr> <tr> <td>Selecting, applying and evaluating advanced stress analysis techniques for a wide range of engineering problems</td> <td>MO3</td> </tr> <tr> <td>Demonstrate a comprehensive understanding of analytical and experimental methods for the solution of strength and stiffness</td> <td>MO4</td> </tr> <tr> <td>Demonstrate a comprehensive understanding of analyse structures subjected to a variety of load types and be able to predict modes of failure</td> <td>MO5</td> </tr> <tr> <td>Modelling and simplifying real problems, and applying mathematical methods of analysis</td> <td>MO6</td> </tr> <tr> <td>Demonstrate key transferable skills in problem formulation and decision making, interpreting experimental results</td> <td>MO7</td> </tr> </tbody> </table>	<b>Module Learning Outcomes</b>	<b>Reference</b>	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
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Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p><a href="https://uwe.rl.talis.com/modules/ufmfmp-15-2.html">https://uwe.rl.talis.com/modules/ufmfmp-15-2.html</a></p>																

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### Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Automotive Engineering (Foundation) [Sep][FT][Frenchay][5yrs] MEng 2018-19

Automotive Engineering (Foundation) [Sep][SW][Frenchay][6yrs] MEng 2018-19

Automotive Engineering (Foundation) [Sep][FT][Frenchay][4yrs] BEng (Hons) 2018-19

Automotive Engineering (Foundation) [Sep][SW][Frenchay][5yrs] BEng (Hons) 2018-19