

COMPOSITES CURRICULUM - Unit Information

This unit forms part of the Masters level Composites Curriculum developed by Bristol and Plymouth Universities.

Taught block title	Performance A	
Unit title	Mechanical properties and testing - static strength, failure modes and failure criteria	
Level (Credit points)	H (2)	
Unit director	Dr. Nuri Ersoy	
Unit description		
<p>This unit forms part of the Masters level Composites Curriculum. It provides Learners with no prior experience with composites with a general introduction to the basic strength properties, failure modes, and failure criteria.</p>		
Core subjects to be covered		
<ol style="list-style-type: none"> 1. Revision of properties obtained by tension, compression, and shear testing. 2. Failure modes under tensile, compressive and shear loading. 3. Multiaxial loading and testing 	<ol style="list-style-type: none"> 4. Failure Criteria <ol style="list-style-type: none"> 4.1 Maximum Stress Failure Criterion 4.2 Maximum Strain Failure Criterion 4.3 Tsai-Wu Failure Criterion 4.4 Hashin Failure Criterion 5. Factor of Safety 	
Statement of unit aims		
<p>The aims of this unit are to:</p> <ol style="list-style-type: none"> 1. Provide Learners with an overview of the strength properties obtained by tensile, compression, and shear tests 2. Provide Learners with an understanding of the failure modes under tensile, compression, and shear, and multiaxial loading 3. Provide the learners with an understanding of industrially relevant failure criteria 4. Give learners an preliminary idea of how to use the failure criteria for design of composite laminates 		
Statement of learning outcomes		
<p>Learners will be able to:</p> <ol style="list-style-type: none"> 1. Assess the factor safety under unidirectional loading in tension, compression, or shear 2. Identify the failure modes under tensile, compression, and shear, and multiaxial loading 3. Understand how the stresses and failure modes interact in the case of multiaxial loading 4. Have a preliminary understanding of how the various failure criteria can be utilized in design of composite laminates 		
Methods of teaching	8 lectures, 1 lab classes and demonstrations, 1 class exercise	
Assessment details if required	Written assignment (85%), 20 minute assessed presentation (15%)	
Timetable information	2 days of teaching in a block	