

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 - dynamic and fatigue	
Level (Credit points)	H (2)	
Unit director		
Unit description		
<p>This unit forms part of the Masters level Composites Curriculum. It builds on the units 'Mechanical properties and testing – anisotropic elasticity' and 'Mechanical properties and testing – static strength, failure modes and failure criteria' to provide Learners with a good understanding of the performance of composite systems under dynamic and fatigue loading conditions.</p>		
Core subjects to be covered		
<ol style="list-style-type: none"> 1. Introduction and definitions 2. Stress and strain controlled loading 3. Fatigue damage development 4. Monitoring fatigue damage 5. Fatigue testing (tension, compression, fully reversed, shear) 6. Fatigue data representation 7. Factors affecting fatigue performance 8. Predicting performance and life under fatigue loads 9. Delamination growth under fatigue 10. Design for fatigue 	<ol style="list-style-type: none"> 11. Low and high velocity impact 12. Impact resistance and impact damage tolerance 13. Impact damage development 14. Factors affecting impact performance 15. Impact test methods and residual properties evaluation 16. Performance under high rate dynamic loading 17. High rate equipment and testing methods 18. Basic principles of crashworthiness and energy absorption mechanisms 17-19. Crashworthiness testing and simulation 	
Statement of unit aims		
<p>The aims of this unit are to:</p> <ol style="list-style-type: none"> 1. Provide Learners with an understanding of the fatigue and dynamic performance of composites 2. Identify the advantages and limitations of these materials under fatigue and dynamic loading conditions 3. Give learners an overview of the testing methodologies for quantifying the performance of these materials 		
Statement of learning outcomes		
<p>Learners will be able to:</p> <ol style="list-style-type: none"> 1. Provide a clear overview of the range of fatigue and dynamic test methods 2. Understand some of the issues associated with the use of composites under fatigue and dynamic loading conditions 3. Establish appropriate procedures for using experimental data in the design against fatigue loading and impact threats 		
Methods of teaching	7 lectures, 2 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
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