

COMPOSITES CURRICULUM - Unit Information

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

Taught block title	Core Block	
Unit title	Properties of Composites	
Level (Credit points)	H (2)	
Unit director	Professor Kevin Potter	
Unit description		
This unit forms part of the Masters level Composites Curriculum. It builds on the units "Introduction to Composites" and "Composites Constituents" to provide Learners with a more in depth understanding of the properties and performance of polymer matrix composite materials and the products made from them.		
Core subjects to be covered		
1. Properties of a single fibre and a dry tow of many fibres	10. Strength and stiffness through thickness	
2. Properties of a tow when a matrix is added	11. Toughness of composite laminates	
3. Properties of a unidirectional laminate of many tows	12. Effects of temperature on properties	
4. Properties of a laminate at an angle to the fibres	13. Effects of moisture on properties	
5. Properties of biaxial and pseudo-isotropic laminates	14. Effects of other environments on properties	
6. Properties of short fibre composites	15. Effects of high strain rates on properties - impact	
7. Properties of 3D reinforced composites	16. Effects of long loading time on properties - creep and fatigue	
8. Properties of post-use recovered fibres	17. Electrical properties of composites	
9. Predicting strength and stiffness of arbitrary lay-up laminates	18. Fire performance of composites	
	19. Test methods for composites	
	20. Data bases of composites performance data.	
Statement of unit aims		
The aims of this unit are to:		
1. Provide Learners with a more detailed view of the development of mechanical properties in composite materials		
2. Demonstrate how laminate mechanical properties may be predicted from fibre and matrix properties		
3. Demonstrate how laminate properties vary with loading direction		
4. Provide the learners with an understanding of non-mechanical properties of composites and the importance of these in product design		
Statement of learning outcomes		
Learners will be able to:		
1. Design a laminate to achieve a specific set of basic mechanical properties		
2. Understand the impact of externally applied loads on that laminate		
3. Appreciate the likely non-mechanical properties of the laminate that has been designed		
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	