

COMPOSITES CURRICULUM - Unit Information

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

Taught block title	Manufacturing Operations B	
Unit title	Tolerancing, variability and defects	
Level (Credit points)	M (2)	
Unit director	Professor Kevin Potter	
Unit description		
<p>This unit forms part of the Masters level Composites Curriculum. It introduces Learners to the factors influencing the geometrical tolerances in composites manufacture, including the impact of variability in both materials and processes. The unit also considers the origins and impacts of a wide range of defects. The course will be delivered from processing science and manufacturing engineering perspectives.</p>		
Core subjects to be covered		
<ol style="list-style-type: none"> 1. Variability in incoming materials 2. Materials specifications and control 3. Thickness variability in bag or "floating tool" moulding 4. Geometric fidelity 5. Spring-in thermoelastic effects 6. Spring-in non-thermoelastic effects 7. What is a defect? 8. Defect Taxonomy 	<ol style="list-style-type: none"> 9. Acceptance criteria 10. Rework, repair and concessions 11. Cosmetic errors 12. Delaminations 13. Voidage 14. Fibre waviness and wrinkling 15. Cure related defects 16. Machining defects 17. Defect root cause investigations 	
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 factors influencing geometrical tolerances in composites mouldings 2. Provide an overview of the sources of variability in materials and processes and how those variabilities manifest through geometrical fidelity 3. Consider the range of potential defects, their possible impacts and the opportunities for mitigation in the process 		
Statement of learning outcomes		
<p>Learners will be able to:</p> <ol style="list-style-type: none"> 1. Identify sources of variability in composite components and manufacturing processes 2. Generate designs which limit or control variability 3. Identify the potential for defect generation in component designs 		
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	