

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 A	
Unit title	Process design	
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 need for a controlled structure for process design in composites to achieve reliable production. It identifies the targets for process control and the difficulties inherent in meeting those targets. It provides a methodology whereby robust decisions on process design can be made.</p> <p>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. The need for process design 2. Identifying expected part thickness 3. Factors impacting mean cured ply thickness 4. Reinforcement consolidation curves 5. Identifying the correct pressure cycle 6. Identifying limiting process parameters for acceptable quality on flat laminates 7. The effect of resin sinks in prepreg mouldings 	<ol style="list-style-type: none"> 8. The impact of bridging in internal radii 9. Consolidation effects on external radii 10. Cure scheduling 11. Maximum and Minimum cure temperatures 12. Heat transfer effects 13. Temperature distribution 14. Exotherm effects 15. Cool down and demould temperature 16. Postcure 17. Cure scheduling 	
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 need for a clearly defined process design to deliver a controlled production 2. Demonstrate to learners where control is needed and provide the tools that can be used in process design 3. Clarify the role of process design within a product design framework 		
Statement of learning outcomes		
<p>Learners will be able to:</p> <ol style="list-style-type: none"> 1. Identify those factors that must be controlled in a composites manufacturing environment 2. Carry out estimates of the impact of poorly controlled processes 3. Integrate process and product design 		
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	