

## COMPOSITES CURRICULUM - Unit Information

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

<b>Taught block title</b>	Manufacturing Processes A	
<b>Unit title</b>	Prepreg processes, vacuum bag	
<b>Level (Credit points)</b>	M (2)	
<b>Unit director</b>	Professor Kevin Potter	
<b>Unit description</b>		
<p>This unit forms part of the Masters level Composites Curriculum. It introduces learners to the processes used in the manufacture of composites structures from preimpregnated reinforcements in single sided tools. Both autoclave moulding and out of autoclave processing routes will be considered. Cored sandwich panels are a very common form of composites structure and are addressed in this unit.</p> <p>The course will be delivered from processing science and manufacturing engineering perspectives.</p>		
<b>Core subjects to be covered</b>		
<ol style="list-style-type: none"> <li>1. Basics of single sided tooling processes</li> <li>2. Bleeders, breathers and vacuum bags</li> <li>3. Tooling features</li> <li>4. Autoclaves and ovens</li> <li>5. Autoclave tooling</li> <li>6. Heat transfer issues</li> <li>7. The development of contact between the prepreg and the tool</li> <li>8. Consolidation issues</li> </ol>	<ol style="list-style-type: none"> <li>9. Cure scheduling</li> <li>10. Sandwich panel basics</li> <li>11. Honeycomb properties</li> <li>12. Foam core properties</li> <li>13. Selecting the right foam or honeycomb core</li> <li>14. Splicing and filleting adhesives</li> <li>15. Machining cores</li> <li>16. Defects in honeycomb cored sandwich panels</li> </ol>	
<b>Statement of unit aims</b>		
<p>The aims of this unit are to:</p> <ol style="list-style-type: none"> <li>1. Provide Learners with an overview of prepreg moulding techniques, including their advantages and disadvantages</li> <li>2. Provide learners with an understanding of the range of processes available, the features of each process and how those features impact on the design of materials to be processed by those processes</li> <li>3. Introduce learners to the manufacture of sandwich panels</li> </ol>		
<b>Statement of learning outcomes</b>		
<p>Learners will be able to:</p> <ol style="list-style-type: none"> <li>1. Select appropriate materials and processes to manufacture composite structures in single sided tools</li> <li>2. Accommodate the characteristics of those processes in the design of composite structures</li> <li>3. Identify where process control is needed to ensure component quality</li> </ol>		
<b>Methods of teaching</b>	7 lectures, 2 lab classes and demonstrations, 1 class exercise	
<b>Assessment details if required</b>	Written assignment (85%), 20 minute assessed presentation (15%)	
<b>Timetable information</b>	2 days of teaching in a block	