

COMPOSITES CURRICULUM - Unit Information

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

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| Taught block title | Performance A | |
| Unit title | Non-structural properties - erosion, wear, electrical and thermal properties | |
| Level (Credit points) | H (2) | |
| Unit director | Stefanos Giannis | |
| Unit description | | |
| This unit forms part of the Masters level Composites Curriculum. It builds on the units under taught block Performance A to provide Learners with a good understanding of non-structural composite material properties and their importance in designing both conventional and multifunctional structures. | | |
| Core subjects to be covered | | |
| 1. Introduction to non-structural properties | 2. Applications requiring non-structural properties | 10. Electromagnetic Interference Shielding (EMI) |
| 3. Solid particle erosion | 4. Effect of erosion and abrasion on surface characteristics and performance | 11. Glass Transition Temperature (T _g) |
| 5. Measuring the erosion wear rate on composites | 6. Electrical conductivity and percolation theory | 12. Factors affecting the T _g |
| 7. Modelling electrical conductivity | 8. Dielectric performance | 13. Measuring T _g using Dynamic Mechanical Analysis (DMA) and Differential Scanning Calorimetry (DSC) |
| 9. Measuring volume resistivity, dielectric constant, dielectric dissipation and loss factors | | 14. Thermal Conductivity |
| | | 15. Factors affecting thermal conductivity |
| | | 16. Thermal Expansion |
| | | 17. Measuring thermal expansion using Dilatometry and Thermomechanical Analysis |
| | | 18. Multi-functional composite materials |
| Statement of unit aims | | |
| The aims of this unit are to: | | |
| 1. Provide Learners with an understanding of the erosion, wear, electrical and thermal performance of composites | | |
| 2. Give learners an overview of the testing methodologies for quantifying the non-structural properties of composites | | |
| 3. Identify the advantages and limitations of these materials when designing multi-functional structures | | |
| Statement of learning outcomes | | |
| Learners will be able to: | | |
| 1. Provide a clear overview of the diverse non-structural properties of composite materials | | |
| 2. Establish appropriate procedures for quantifying non-structural performance of composites | | |
| 3. Understand some of the issues and opportunities associated with the use of composites in multi-functional structures | | |
| 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 | |