COMPOSITES CURRICULUM - Unit Information

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

Taught block title	Performance B
Unit title	Recycling and reuse
Level (Credit points)	H (2)
Unit director	Professor John Summerscales

Unit description

This unit forms part of the Masters level Composites Curriculum. It builds on the unit "Introduction to Composites" and "Composites Constituents" to provide Learners with a good understanding of the economic and environmental issues arising from the selection of composite systems.

Core subjects to be covered

1. Sustainability: economic, environmental, equity, governance
2. Directives, regulations and legislation
3. Hierachy of end-of-life (HEOL) options, establishing ownership of abandoned components, and the circular economy
4. HEOL1: design for end-of-life
5. HEOL2: the manufacture and marketing phase
6. HEOL3: the use phase ~ how are environmental burdens minimised?
7. HEOL4: reuse of (sub-)components
8. HEOL5: reprocessing thermoplastic composites
9. HEOL6: regeneration of raw materials or their precursors from thermosetting systems
10. HEOL7: recovery and/or degradation of reinforcement fibres
11. HEOL8: Incineration, composting, landfill or scuttle
12. Life Cycle Costing
13. Life Cycle Assessment: ISO 14040 series
14. Environmental Impact Classification Factors
15. "Goal and Scope" and allocation in LCA Software: Simapro, EcoInvent, CES EduPack

Statement of unit aims

The aims of this unit are to:

1. Give Learners an understanding of the economic and environmental issues surrounding the use of composites
2. Provide Learners with an overview of the options for limiting the impact of composites on the environment
3. Give Learners the tools to balance economic and environmental considerations in component design

Statement of learning outcomes

Learners will be able to:

1. Provide a clear overview of the economic issues and environmental burdens of composite systems
2. Establish an appropriate composite system for a specific application
3. Understanding of issues constraining the market for composites

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