

UNIVERSITY OF PLYMOUTH MODULE RECORD

MODULE CODE: MECH 513

CREDITS: 20

LEVEL: M

MODULE TITLE: Smart Materials and Intelligent Structural Systems

PRE-REQUISITE(S): None

CO-REQUISITE(S): None

COMPENSATABLE WITHIN THIS PROGRAMME: Yes

SHORT MODULE DESCRIPTOR: This module consists of four blocks which are Materials Engineering (underpinning background knowledge); Advanced Composites (fibre-reinforced polymers and nanotechnology); Sensors, (Control) and Actuators and finally Structural Systems which integrates the previous three elements.

ELEMENTS OF ASSESSMENT: COURSEWORK 50% EXAMINATION 50%

Subject Assessment Panel Group to which module should be linked: BEng Mech and Marine
Minimum pass mark for professional body accreditation: 50%

MODULE AIMS: This module should equip graduates to comprehensively address the application of advanced materials in the future climate of balanced economic and environmental constraints.

ASSESSED LEARNING OUTCOMES: At the end of the module the learner **will be expected to be able to:**

- 1 Understand the diverse solutions to engineering problems in the context of this module
- 2 Critically evaluate, select and use appropriate materials and characterisation techniques
- 3 Identify and model a smart material/intelligent structural system

(Knowledge and Understanding LO1; Cognitive/intellectual skills LO 2; Key/transferable skills ; Practical skills LO 3)

INDICATIVE SYLLABUS CONTENT:

MATERIALS ENGINEERING: metals, ceramics, polymers, semiconductors. Surface coatings, thin films and biomaterials. Materials characterisation. Sustainability. **ADVANCED COMPOSITES:** fibre-reinforced materials, nanotechnology. **SENSORS, (CONTROL) AND ACTUATORS.** **STRUCTURAL SYSTEMS:** condition monitoring and structural health monitoring of structural systems. Industrial and commercial applications.

APPROVAL: DATE OF APPROVAL: 09/12/04

DATE OF IMPLEMENTATION: Sept 2005

DATE(S) OF APPROVED CHANGE: XX/XX/XX

FACULTY: Technology

DEPT: SoE

PARTNER INSTITUTION: N/A

MODULE LEADER: Dr. J Summerscales **Term** T2