

UNIVERSITY OF PLYMOUTH MODULE RECORD

Module Code: MECH 108	Credits: 20	Level : 1
Module Title : Mechanics		
Pre-Requisites :		
Co - Requisites :		
If Linked, Module linked to :		
Short Module Descriptor - (Maximum four lines 9pt print): This module introduces the basic concepts relating to the interaction between systems and their surroundings.		
Elements of Assessment COURSEWORK 50% EXAMINATION 50%		
Module Aims : To convey an understanding of basic engineering principles as applied to Mechanical Systems (both Static and Dynamic).		
Skills Elements : The development of written, group working, numeracy, independent study and practical skills.		
Objectives / Learning Outcomes: Students who have successfully completed this module should be able to: <ol style="list-style-type: none"> 1. identify the loading on a system or system element and apply the conditions for static equilibrium. 2. determine the stresses induced in engineering systems and components as a consequence of being subjected to direct, shear and bending effects. 3. understand the dynamic behaviour of engineering systems having translational and rotational motion. 		
Indicative Syllabus Content : <ol style="list-style-type: none"> 1. Forces and moments: Definition of a force, Newton's laws, Combination of vectors, Rotational effects of a force. 2. Free body diagrams 3. Static equilibrium: Bodies or components in equilibrium, Procedure for solving equilibrium problems. 4. Structures: Pin jointed structures – Frameworks & Mechanisms; Beams - Internal forces and moments, Shear force diagrams, Bending moment diagrams, Principle of superposition, Standard results. 5. Area properties: First moment of area, Centroid - Composite shapes Neutral axis, Second moment of area, Parallel axis theorem 6. Stress analysis: Direct or axial stress - Axial strain, Young's Modulus, Ultimate tensile stress; Factor of safety; Material testing; Shear stress, average. Shear strain, Poisson's ratio. 7. Bending theory: Bending stresses - Influence of section. 8. Circular shafts in torsion 9. Kinematics (rectilinear and curvilinear motion). 10. Relative Motion. 11. Properties of Mass: Centre of mass, Moment of inertia, Parallel Axis Theorem, Radius of gyration. 12. Kinetics: Particles, Rigid bodies, Fixed axis, General plane motion. 13. Simple Harmonic Motion: springs, connecting rods, Unifilar and Trifilar suspensions. 14. Momentum: Conservation of linear and angular momentum, Impacts, Coefficient of Restitution, Varying mass problems. 15. Work and Energy: Kinetic, Potential and Strain energy, conservation of energy. 16. Friction: static and dynamic. 		
Please complete the information below		
Faculty: Technology	Dept: SoE	Partner Institution: N/A
Module Leader: A Hunt	Subject Group: B5	Terms: Autumn and Spring
Registry Use Only		
VALIDATION- DATE OF APPROVAL:		DATE OF IMPLEMENTATION : September 2006
DATES(S) OF APPROVED CHANGES:		
ASC:	FEEBAND :	RESOURCE UNITS :