DMX4205 Strength of Materials I

Level	4
Course Code	DMX4205
Course Title	Strength of Materials I
Credit value	2
Core/Optional	Core
Course Aim/s	The aim of this course is to give theoretical knowledge supported by practical work, to analyze and design mechanisms using the concepts of strength of materials.
Course Learning Outcomes (CLO):	At the completion of this course student will be able to: CLO1: Determine the stress and strain due to complex loading conditions and analyze stress and strain using of Mohr's circles. CLO2: Analyze beams subjected to different types of loads, and moments with the aid of bending moment diagrams and shear force diagrams for stresses and deflections. CLO3: Determine the stresses and angular deflections set up in solid and hollow shafts due to torsion, when connected in series and parallel. CLO4: Demonstrate the knowledge of strain energy in the analysis of loaded components, and apply Castigliano's theorems to solve problems. CLO5: Determine stresses and strains set up in thin shells and wire wound thin cylinders due to internal pressure. CLO6: Demonstrate the knowledge on the behaviour of struts and columns under different loading conditions and determine the stresses and deflections. CLO7: Solve the problems combined torsion, axial loads and bending moments. CLO8: Analyze the stresses induced in closed coil helical springs due to axial loads.
Content	**Outline Syllabus:** Unit 1: Two - dimensional complex stress & strain systems Unit 2: Bending Unit 3 : Slope and deflection of beams Unit 4 : Shear stress distribution Unit 5 : Buckling of Struts and Columns Unit 6 : Strain energy Unit 7 : Torsion Unit 8 : Spring **Laboratory work:** 1. Examining the torsional behaviour of circular bars 2. Determination of the forces developed in a triangular roof truss 3. Determination of the spring stiffness 4. Determining the deflection in beams under different loads