

MT-516	Computational Mechanics
	<p><u>Continum Mechanics and Tensor Analysis:</u> Introduction, Kronecker delta, Permutation symbol, Matrix algebra, Dot and cross product, covariant and contravariant basis, differentiation in stationary coordinates frame, Christoffel symbols, Nabla operator, Gradient, divergence, curl, stress tensor, stress vector, strain tensor, elasticity tensor, plane stress and strain, Numerical solution by Galerkin and Ritz approaches.</p> <p><u>Material Mechanics:</u> Tension, compression, shear, axially loaded membrane, Torsion, shear forces and bending moments, stresses beams, columns, Centroid and moment of inertia.</p> <p><u>Computational Mechanics for Composite Material:</u> Introduction, Elasticity problem, Elastoplastic problem, Sensitivity analysis for some composites fractures and fatigue models for composites reliability analysis.</p> <p><u>Reference Books:</u></p> <ol style="list-style-type: none">1. Talpaert Y.R, <i>Tensor Analysis and Continuum Mechanics</i>, Springer, 2003.2. James M. G. And Barry J.G, <i>Mechanics of Materials</i>, 7th edition, CENGAGE Learning, 2009.3. Kaminski M. M, <i>Computational Mechanics of Composite Materials</i>, Springer, 2005.