

1.	Title of the course	Continuum Mechanics
2.	Course number	ME543L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	Modified with ME519L/INTRODUCTION TO CONTINUUM MECHANICS
5.	To be offered by	Mechanical Engineering
6.	Prerequisite	CoT
7.	<b>Course Objective(s):</b> To discuss the general theory of deformable continuum which includes the solids, fluids, and other complex materials. To analyze the mathematical relations for the physical laws and the constitutive relations for continuous media. To study the analytical solutions of some boundary and initial-boundary value problems.	
8.	<b>Course Content:</b> Introduction to tensor: tensor algebra, tensor calculus, Kinematics: reference and deformed configurations, motion and deformation of body, strains, strain rates, Concept of stress: Cauchy stress, Piola-Kirchhoff stresses, Cauchy theorem, Balance laws: mass balance, linear and angular momentum balance, energy balance, Clausius-Duhem inequality, Frame indifference, Material symmetry, Definition of solids and fluids, Constitutive relations, Elastic materials: nonlinear elasticity, linearized elasticity, Introduction to viscoelasticity and plasticity, Some boundary and initial-boundary value problems from solid mechanics and fluid mechanics.	
9.	<b>Textbook(s):</b> 1. Chadwick P, Continuum Mechanics: Concise Theory and Problems, 2nd Edition, Dover (2012). 2. Gurtin M E, An Introduction to Continuum Mechanics, Academic Press (1982).	
10.	<b>Reference(s):</b> 1. Gurtin M E, Fried E and Anand L, The Mechanics and Thermodynamics of Continua, Cambridge University Press (2013). 2. Jog C S, Continuum Mechanics: Foundations and Applications of Mechanics, Volume-I, 3rd Edition, Cambridge University Press (2015). 3. Malvern L E, Introduction to the Mechanics of a Continuous Medium, Pearson (1977) 4. Silhavy M, The Mechanics and Thermodynamics of Continuous Media, Springer (2002).	