

Math 439: Lagrangian Mechanics, Dynamics, and Control

Angular momentum and the inertia tensor, rigid body motion. Configuration space, generalized coordinates, and the Euler-Lagrange equations. Simple mechanical systems, general inertia tensors, and geodesic motion. Forces - dissipative forces, potential forces. Nonholonomic constraints and d'Alembert's principle. Simple mechanical control systems, modelling, linearization about equilibrium points, linear controllability tests for mechanical systems. Mechanical control systems equivalent to kinematic systems, trajectory generation.