Mechanical Engineering

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Courses

EN.530.101. Freshman Experiences in Mech. Eng.. 2 Credits.
An overview of the field of mechanical engineering along with topics that will be important throughout the mechanical engineering

EN.530.653. Advanced Systems Modeling.

This course covers the following topics at an advanced level: Newton's laws and kinematics of systems of particles and rigid bodies; Lagrange's equations for single- and multi-degree-of-freedom systems composed of point masses; normal mode analysis and forced linear systems with damping, the matrix exponential and stability theory for linear systems; nonlinear equations of motion: structure, passivity, PD control, noise models and stochastic equations of motion; manipulator dynamics: Newton-Euler formulation, Langrange, Kane's formulation of dynamics, computing torques with O(n) recursive manipulator dynamics: Luh-Walker-Paul, Hollerbach, O(n) dynamic simulation: Rodrigues-Jain-Kreutz, Saha, Fixman. There is also an individual course project that each student must do which related the topics of this course to his or her research.
Instructor(s): G. Chirikjian.

EN.530.654. Advanced Systems Modeling II.

A continuation of EN.530.653, this course covers the following topics at an advanced level: Newton's laws of kinematics of systems of particles and rigid bodies; Lagrange's equations for single- and multi-degree-of-freedom systems composed of point masses; normal mode analysis and forced linear systems with damping, the matrix exponential and stability theory for linear systems; nonlinear equations of motion; structure, passivity, PD control, noise models and stochastic equations of motion; manipulator dynamics: Newton-Euler formulation, Lagrange, Kane's formulation of dynamics, computing torques with O(n) recursive manipulator dynamics:Luh-Walker-Paul, Hollerbach, O(n) dynamics simulation: Rodriques-Jain-Kreutz, Saha, Fixman. There is also an individual course project that each student must do which relates the topics of this course to his or her research.
Instructor(s): G. Chirikjian.