

MEC 568 ADVANCED DYNAMICS

Course Outline

1. Particle Kinematics
2. Particle Dynamics
3. Dynamics of a System of Particles
4. Newtonian Kinetics of a Rigid Body
 - a. Fundamental Principals
 - b. Angular Momentum and Inertia Properties
 - c. Equations of Motion
 - d. Impulse and Momentum Principals
 - e. Other Topics
5. Introduction to Analytical Mechanics
 - a. General Coordinates and Degrees of Freedom
 - b. Constraints – Holonomic and Nonholonomic
 - c. Hamilton's Principal
 - d. Lagrange's Equations
6. Introduction to Theory of Small Oscillations
 - a. Normal Modes of Vibration
 - b. Normal Coordinates
 - c. Small Oscillations About Steady State

References:

- *Principles of Dynamics*
Donald T. Greenwood (Prentice Hall)
- *Classical Dynamics of Particles and Systems*
Jerry B. Martin and Stephen T. Thornton (HBJ Publishers)
- *Methods of Analytical Dynamics*
Meirovitch (McGraw Hill)

Grading

- Midterm Exam 40%
- Final Exam 45%
- Homework 15%

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