

ASEN 5022: Introduction to Dynamics of Aerospace Structures (Spring, 2006)

Instructor: K. C. Park (ECAE 185, 492-6330, E-Mail: kcpark@colorado.edu)
Texts: *Primary text: Principles and Techniques of Vibrations* by L. Meirovitch.
Secondary text: Mechanical Vibrations by Geradin and Rixen
(Course coverage: Chaps. 1 through 4, 7.1-7.14, 8.11-8.12, and 9.4)
Time/Place: TTh 3:30 – 4:45 / (ECCR 116)
Grading: Homework 30%. Two midterm quizzes 30%, @ 15% each. Final exam 40%.
Web Address: <http://caswww.colorado.edu/courses.d/IADYN.d/ASEN5022.schedule.2006.html>

Course Outline

1. Dynamics of Discrete Systems (4 weeks)
 - Kinematics, Reference frames, Cartesian and curvilinear coordinates.
 - Review of analytical dynamics.
 - Free vibration, harmonic excitations, damped vibrations, transient response.
 - Principle of virtual work, D'Alembert's principle, Lagrange's equations, Hamilton's principle.
2. Dynamics of Continuous Systems (3 weeks)
 - Equations of motion, variational principles for continuous system, vibration analysis of continuous systems.
 - wave propagation and model solution.
 - finite element approximation of continuous vibrating systems.
3. Computational Methods for Vibration and Transient Analysis (3 weeks)
 - Free vibrations, wave propagation, transient analysis.
4. Applications (4 weeks)
 - Vibration measurements, shock isolation, coupled systems, vibration control.
5. Special topics (1 week)
 - TBD.