AE 6220 ROTORCRAFT STRUCTURAL DYNAMICS AND AEROELASTICITY

LIST OF TOPICS

Introduction
Review of Blade Element/Momentum Theory (for general blade element)
Rigid Blade Flapping in Hover
Derivation of Flap-Lag Equations of Motion In Vacuo
Analysis of Flap-Lag Dynamics In Vacuo
Review of the Concept of Stability
Derivation of Flap-Lag Aerodynamic Generalized Forces
Analysis of Flap-Lag Stability
Dynamic Inflow in Hover
Dynamic Stall
Ground Resonance
Derivation of Elastic Blade Equations In Vacuo for Planar Bending
Methods for Obtaining Modes of Elastic Blades
      Rayleigh-Ritz/Galerkin methods
      Finite element method
Accurate Calculation of Shear Forces and Bending Moments
Review of the Theory of Finite Rotations in Nonlinear Kinematics
Nonlinear Theory of Composite Beams
Dynamic Inflow in Forward Flight
Harmonic Balance and Trim Prodecures
Floquet Theory
Multi-blade Coordinates