

Spring 2014 Course Announcement

AE 550 – NONLINEAR AEROELASTICITY

8:00 - 9:20 am Tu Th 225A Talbot Lab.

Call No. 56808 – 4 Hours

Prerequisites: AE 451 or consent of instructor.

Instructor: Harry H. Hilton

316 Talbot Lab., MC - 236

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<http://www.ae.illinois.edu/people/faculty/hilton.html>

Who should take this course: Students interested in engineering, aeroelasticity, dynamics, fluid-solid interaction, structural mechanics, structural & motion control

Brief course description: An integrated fundamental approach to inter-active closed loop nonlinear aerodynamics and structural (nonlinear materials & aerodynamics, large deformations) dynamical responses. Fluid-solid interactions of unsteady aerodynamics and flexible structures and their components with applications to air-space-land vehicles, windmills, solar sails, and gossamer structures. Nonlinear formulations and solutions relating to: oscillators, damping, torsional divergence, flight control, control effectiveness and reversal, chord-wise & in-plane bending, accelerated flight problems, unsteady aerodynamics, stall flutter, flutter analysis in time & frequency domains, panel flutter, response to aerodynamic noise, motion control, shell-flow interactions, gust effects, aero-servo-elasticity, computational aspects & solutions, limit cycles, chaos in autonomous systems. Theoretical treatment with applications to engineering problems.

Text: Instructor's handouts (Required, free)

Dowell, Earl H. and Marat Ilgamov (1988) *Studies in Nonlinear Aeroelasticity*.

Springer. (Optional)

This course is offered on a two-year cycle. **Subsequent offering: Spring 2016.**

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