MAE-275 ADVANCED AIRCRAFT STABILITY AND CONTROL
Spring Quarter

CATALOG DATA: Mechanical and Aerospace Engineering 275, **Advanced Aircraft Stability and Control,** Units 4: Lecture – 3 hours; Discussion – 1 hour. Spring Quarter, Alternate years. Development and analysis of aircraft equations of motion. Flexible modes. Response to control actuation. Random inputs and disturbances. Stability and control augmentation system design. Handling qualities. Nonlinear effects.

PREREQUISITES: Mechanical Engineering 172 or equivalent course.

TEXT: Class notes – Excerpts from McRuer, D., Ashkenas, I., and Graham, D., *Aircraft Dynamics and Automatic Control*, Princeton University Press

INSTRUCTOR: R. A. Hess

GOALS: To introduce the student to topics in aircraft stability and control. To provide background dealing with the effects of manual and automatic feedback control on aircraft dynamics characteristics and handling qualities

MODE OF GRADING: Letter grad based upon homework and examinations (projects):

Homework:	30%
Mid-Term Exam (or project)	30%
Final Project	40%

TOPICS:

1.) Development of aircraft equations of motion
2.) Analysis of longitudinal and lateral aircraft dynamics
3.) Elementary longitudinal and lateral feedback control systems
4.) Description of random processes
5.) Atmospheric disturbances
6.) Stability/control augmentation design, multi-input, multi-output systems
7.) Analysis of rotorcraft and V/STOL aircraft
8.) Aircraft handling qualities. Control theoretic models of the human pilot
9.) Flexible aircraft
10.) Nonlinear effects. Actuator saturation

CLASSROOM AND TIME: Room 1006 Geidt Hall, Tu, Th, 12:10-2:00

OFFICE HOURS: TBD; Assignments, handouts, etc. on SmartSite

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