HELICOPTER STABILITY AND CONTROL

Catalog Data: AE6503 Helicopter Stability and Control 3-0-3. Prerequisite: AE 4070 (Rotor and Propeller Theory) and AE 3521 (Flight Dynamics) or consent of School.
Helicopter general equations of motion, rotor forces and moments, helicopter stability and control characteristics, handling qualities, flight control system design.

Textbook: G. Padfield: Helicopter Flight Dynamics; The Theory and Application of Flying Qualities and Simulation Modeling. AIAA Education Series, 1995.

Coordinator: J. V. R. Prasad

Goals: The course prepares students with a detailed analysis capability of helicopter flight dynamics aspects comprising of modeling, simulation, stability, and control.

Topics		**Hours**
1.	Introduction and review of general equations of motion	3
2.	Rotor dynamics	5
3.	Rotor forces and moments	4
4.	Simplified equations of trim	2
5.	Linearized equations	1
6.	Stability and control derivatives	2
7.	Static stability characteristics	3
8.	Longitudinal dynamic characteristics	3
9.	Lateral/yaw dynamic characteristics	3
10.	Coupling of rotor, inflow and body dynamics	3
11.	Handling qualities	3
12.	Flight control system design	5
13.	Introduction to rotorcraft turbulence analysis	3
	Quizzes and instructor's option	5
	Total	45

Computer Usage:

Individual student projects and use of computer software for stability and control analysis.

Laboratory Projects:

None