AE 426 COURSE SYLLABUS

1. Department, Number and Title of course
Department: Aerospace Engineering
Course Number: AE 426
Course Title: Flight Dynamics

2. Designation: Required Course

3. Course (Catalog) Description
Flight performance. Static and dynamic flight stability and control of flight vehicle. Rocket trajectories and satellite orbits.

4. Prerequisites(s)
AE 220 or equivalent

5. Textbook(s) and or other required material

6. Course objectives:
   - To introduce students to the fundamental concepts of atmospheric flight dynamics.
   - To allow students to analytically estimate static and dynamic stability derivatives.
   - To enable students to study and predict aircraft performance.
   - To allow students to study the stability of longitudinal and lateral motions using the linearized equations of motion.
   - To enable students to control aircraft using the root locus method.

7. Topics Covered
   - Introduction
   - Static Stability (Chapter 2)
   - Aircraft Equations of Motion (Chapter 3)
   - Aircraft Performance (AE220 book)
   - Longitudinal Motion (Chapter 4)
   - Lateral Motion (Chapter 5)
• Introduction to Control Theory (Chapter 6)
• Aircraft Autopilot Design Using Control Theory (Chapter 8)

8. Class/Laboratory Schedule:
3 lectures per week, 50 minutes each.

9. Course outcomes
   Outcome#1: Students will demonstrate a good understanding of flight dynamics. (Objectives 1-2)
   Outcome#2: Students will demonstrate a good understanding of flight performance, stability, and control. (Objectives 2-5)
   Outcome#3: Students will demonstrate the ability to use MATLAB® as a tool for matrix manipulations and dynamic simulation. (Objectives 2-5)
   Outcome#4: Students will demonstrate the ability to work as a team in a project, give a professional PowerPoint presentation and write a technical document. (Objectives 1-5)