Engineering Faculty Document No.: 2-00
Date: September 19, 2000

TO: Faculty of Schools of Engineering

FROM: Faculty of the School of Aeronautics and Astronautics

SUBJECT: Change in Course Content and Course Number

The Faculty of the School of Aeronautics and Astronautics has approved the change in the description of the course content and course number listed below. This action is now submitted to the Engineering Faculty with a recommendation for approval.

FROM:

AAE 464 Control System Analysis

Sem. 1 and 2, class 3, cr. 3.
Prerequisite: EE 201; MA 303 or 304; corequisite: AAE 340

Modeling, analysis, and control of dynamical systems with aerospace applications. Transfer functions, block diagram algebra. Routh-Hurwitz stability criteria. Introduction to system design using root locus, Bode, and Nyquist diagrams.

TO:

AAE 364 Control System Analysis

Sem. 1 and 2, class 3, cr. 3.
Prerequisite: EE 201, MA 304; corequisite: AAE 340

Modeling and analysis of dynamical systems with aerospace applications. Laplace transforms, transfer functions, block diagrams. Transient and steady-state response of dynamical systems. Root Locus, Bode, Nyquist methods for control systems analysis. Introduction to controller design.

Reason: The proposed changes reflect more precisely what is being taught, and the intended Junior level.

Thomas N. Farris, Professor and Head
School of Aeronautics and Astronautics

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE COMMITTEE ON
FACULTY RELATIONS

CFR Minutes #929

Date 10/11/00

Chairman CFR C. D. Sutton

AAE 364

Control System Analysis

Description:

Modeling and analysis of dynamical systems with aerospace applications. Laplace transforms, transfer functions, block diagrams. Transient and steady-state response of dynamical systems. Root Locus, Bode, Nyquist methods for control systems analysis. Introduction to controller design.

Format: 3 hrs. lecture per week

Credit hours: 3

Status: Required, Sem. 6

Offered: Fall & Spring

Prerequisite: EE 201, MA 304

Corequisite: AAE 340

Course Instructors: A. Frazho, M. Rotea

Text: Ogata, *Modern Control Engineering*, Prentice-Hall, 3rd Edition, 1997

Assessment Method: 20% Homework, 80% Midterm Exams and Final.

Course Objective:

This course is designed to give students (a) frequency domain methods for analyzing linear systems and (b) introduction to controller design (PID).

Topics:

1. Examples of control systems (2 classes)
2. Review of complex numbers and complex functions (3 classes)
3. Laplace transforms (3 classes)
4. Solution to ordinary differential equations (3 classes)
5. Transfer functions and block diagrams (3 classes)
6. Modeling of mechanical, electrical, electromechanical systems, and selected aerospace systems (4 classes)

7. Transient response and steady-state error analysis (8 classes)
8. Stability and the Routh test (3 classes)
9. The root locus (6 classes)
10. Introduction to PID design using the root locus (4 classes)
11. Bode plots, transfer function estimation, and Nyquist stability criterion (4 classes)
12. Exams (2 classes)

Computer Usage:

About 40% of homework requires computer work.