EGN 4432 – DYNAMIC SYSTEMS
Common Course Syllabus

Catalog Description: 3 CREDITS. Acquaints students with basic knowledge about dynamic systems, systems stability analysis, and basic controller design.

Goals: To acquaint Ocean and Mechanical Engineering students with basic knowledge about dynamic systems, systems stability analysis, and basic controller design.

Prerequisites:
1. EGN 3321 - Dynamics or equivalent
2. EGN 2213 Computer Applications in Engineering I or C for Engineers EEL 2161C
3. MAP 3305 – Engineering Mathematics I or MAP 2302 Differential Equations I

(all with a grade of C or above).

Topics:
1. Mathematical modeling of basic mechanical systems
2. Transient and steady-state responses
3. Numerical solutions of ordinary differential equations
4. Simulation of dynamic systems
5. System transfer functions and block diagrams
6. Closed-loop systems and system stability
7. PID controller design
8. Linearization

Course Outcomes: (numbers in parentheses indicate the correlation of the outcome with the appropriate ABET program outcomes 1-7)
1. A basic knowledge of the fundamental principles governing the dynamics of simple mechanical and electro-mechanical systems. (1)
2. An ability to apply the knowledge of mathematics and engineering to model simple dynamic systems. (1)
3. An ability to simulate dynamic systems using computer simulation tools. (1)
4. An ability to characterize the stability properties of a dynamic system. (6)
5. An ability to design a simple feedback control system that meets desired system output specifications. (2)

Design Content:
The course has one (1) credit of design content. 33% of the course grade will be based on open-ended design homework problems and the project.

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