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
3. MAP 3305 – Engineering Mathematics I or MAP 2302 Differential Equations I

Topics: (the numbers of lectures are guidelines and are subject to change by the instructor)
1. Introduction to control systems
2. Mathematical models of dynamic systems
3. Analytical solutions of systems input-output equations
4. Numerical solutions of ordinary differential equations
5. Simulation of dynamic systems
6. System transfer functions
7. Closed-loop systems and system stability
8. Control systems

Course Outcomes: (numbers in parentheses indicate 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, thermal, fluid and electrical systems. (1,2,6)
2. An ability to apply the knowledge of mathematics and engineering to model simple dynamic systems. (1,2,6)
3. An ability to simulate dynamic systems using computer simulation tools. (1,2,6)
4. An ability to characterize the stability properties of a dynamic system. (1,2,6)
5. An ability to design a simple feedback control system that meets desired system output specifications. (1,2,6)

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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