EE 418- Automatic Control Systems

Hour: Lecture: 2 Hrs. Tutorial: 2 Hrs. Credit: 3.
Coordinator: Hasan Ibrahim

Text Book:

- Benjamin C.Kuo, "Automaic Control Systems", Prentice Hall, Inc

Specific course information

a. Introduction to open loop and closed loop control system. Control system classification. Block diagram. System transfer function and signal flow graph. Standard input signal. Time domain specifications. Modeling of some physical systems. Time response of first and second order systems. Importance of feedback, sensitivity to parameter variations. System stability and effect of disturbance. Error analysis and error constants. Root locus techniques. Frequency domain analysis (Nyquist- Bode) Analog controllers. Controller tuning.
b. Prerequisite: EE 218 OR EE 328
c. Designation: Required

Specific goals for the course:

- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to identify, formulate, and solve engineering problems.
- An ability to use the techniques, skills, and modern engineering tools necessary for Mechanical engineering practice.

Course instruction outcomes:

- The students will be able to understand stability concept and time domain analysis using time and frequency response.
- The students will be able to learn Modeling and analysis of simple physical systems are investigated.
- The students will learn controller units, their type analysis and tuning

Student outcomes:

C, E

Topics Covered:

- Introduction to control systems
- Differential equations of physical systems
- Block diagram and signal flow models using MATLAB

- Performance of 1st order and higher order systems
- Stability concepts
- Root locus, Bode and Nyquist plots
- Feedback system design
- Analog controllers

Course / credit hours	Math & Basic Sciences	Engineering Topics	General Education
Automatic Control Systems /3		**3**	