

EEL 4652 Control Systems 1

Credits: 3

Text book, title, author, and year: *Modern Control Systems, Dorf and Bishop, 10th edition, Prentice Hall, 2004*

Supplemental materials: Instructor's notes.

Specific course information

- a. **Catalog description:** This course introduces students to basic concepts in feedback control systems, analysis and design. Participants learn the meaning of feedback control, modeling, transient and steady state, analysis method such as root locus and Nyquist, stability and margins, frequency response, and design.
- b. **Prerequisites:** Linear systems EEL4656
- c. **Required, elective, or selected elective:** Elective

Specific goals for the course

Specific outcomes of instruction: Students will:

- a. Learn Feedback, Model using, Signal Flow Graph
- b. Understand Transient and Steady State concepts
- c. Analyze using Signal flow graph and Root Locus methods
- d. Understand multi-approaches to stability and margins
- e. Learn and use Frequency response
- f. Learn to design
- g. Be introduced to State Variables (if time permits)
- h. Be introduced to Digital Control

Brief list of topics to be covered:

- Introduction + why feedback
- Modeling
- Signal flow graph
- Transient Response
- Stability
- Steady state
- Root Locus
- Frequency response
- Stability in the frequency domain
- (+gain and phase margins)
- Specifications and Design
- Introduction to State Variables (if time permits)
- Introduction to Digital Control