EEL 5654 Control Systems 2

Credits: 3 credits


Reference materials: N/A

Specific course information:

Catalog description: This is a second course in Control Systems covering more advanced topics from Digital Control, Nonlinear Systems and Control and Control Instrumentation.

Prerequisites: EEL 4652 Control Systems 1; Course is typically taken at the Senior year or at the graduate level in Electrical Engineering

Specific goals for the course:

1) Understanding how to implement controllers digitally
2) Understanding how to analyze and simulate control systems that suffer from nonlinearities
3) Learn about advanced nonlinear control design methods
4) Understanding more in-depth actuators (such as DC motors) and how to select them for a given application
5) Learn in more depth how to model complex control systems (such as aircrafts and robots), using Lagrange equations

Brief list of topics to be covered:

- Course Syllabus; Review of basic concepts covered in Control Systems 1 – transfer functions, stability and transient response
- Review of basic concepts from Control Systems 1 – controller design techniques
- Controller digital implementation; The Z Transform and properties
- Digital Control basics: Stability in the Z plane, Sampling and Hold
- Digital Control: Discretizing of control processes; Simulation techniques using Simulink.
- Nonlinear models; Classification of Equilibrium Points; Linearization.
- Modeling Piecewise Linear Nonlinear Systems; Servo models with saturation, backlash and dead-zone nonlinearities