

## **ELEG 4403 – Control Systems**

### **Credits and Contact Hours**

Three credit hours, 45 hours of instructor contact

### **Instructor's Name**

Roy McCann

### **Textbook**

Modern Control Systems 12<sup>th</sup> Edition, Dorf and Bishop, 2011.

### **Specific Course Information**

- a. Catalog description: Mathematical modeling of dynamic systems, stability analysis, control system architectures and sensor technologies. Time-domain and frequency-domain design of feedback control systems: lead, lag, PID compensators. Special topics in microprocessor implementation.
- b. Pre-requisites: ELEG 3123.
- c. Elective course

### **Specific Goals for the Course**

Indicate the student outcomes listed in Criterion 3 addressed by the course:

- (a) Students should acquire an ability to apply knowledge of mathematics, science and engineering to the analysis and design of feedback control systems.
- (b) Students should acquire an ability to design and conduct experiments, as well as to analyze and interpret data related to feedback control systems.
- (c) Students develop the ability to design feedback control systems to meet performance specifications.
- (e) Students should acquire an ability to identify, formulate, and solve engineering problems related to feedback control systems.
- (f) Students should acquire an understanding of professional and ethical responsibility.
- (g) Students should be able to communicate engineering projects effectively in written formats.
- (h) Students should have the broad education necessary to understand the impact of engineering solutions in a global and societal context.
- (i) Students should have a recognition of the need for, and an ability to engage in life-long learning.
- (j) Students should acquire a knowledge of contemporary issues.
- (k) Students should develop an ability to use the techniques, skills, and modern engineering tools (such as PSPICE and MATLAB) necessary for engineering practice related to electrical and electronic circuits and systems.

### **List of Topics**

1. Introduction & Modeling (3 classes).
2. Feedback System Characteristics (6 classes).
3. Feedback System Performance (6 classes).
4. Stability Analysis (6 classes).

5. Root Locus Design Methods (6 classes).
6. Frequency Domain Techniques (6 classes).
7. Methods of Controller Design and Simulation (12 classes).