EENG 4316/5340: Digital Control Systems
Spring 2020 Syllabus

Instructor Information:

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Office Hours:

Monday	: 12 (noon) to 1:30PM
Wednesday	: 12 (noon) to 1:30PM
Additional Hours	: By appointment

Course Description:

The objective is to develop understanding of

Signal Conversion and Processing
The z-Transform
Transfer Functions, Block Diagrams and Signal Flow Graphs
The State Variable Technique
Controllability, Observability and Stability
Time-Domain and z-Domain Analysis
Frequency-Domain Analysis
State Feedback Design
Outpout Feedback Design

Recommended Textbook:

Kuo, Benjamin *Digital Control Systems* (2nd Edition), The Oxford series in electrical engineering ISBN-13: 978-0195120646

Evaluation and Grading:

The course grade will be based on the following activities:

1. **Homework Assignments (50%):**
   Homework will be assigned and it should be submitted through canvas using pdf or word format. No late submissions allowed. Collaboration on homework assignments is strongly encouraged, however expecting a disclaimer statement at the end of your assignments if you have discussed with the students in the class or someone outside. All resources, including materials obtained from

internet should be properly acknowledged. There will be five homework assignments

2. **Tests (30%):**
   There will be three tests of duration 2 hour each as given in the outline. There will be a grade replacement policy. For example, if your Test 2 grade is better than Test 1, then Test 1 grade will be replaced with the Test 2. This approach will be followed for other tests. For Test 3, you will get a score of at least an average of two previous tests. It is important that you should attend all tests and should score at least 50% to be eligible for grade replacement policy.

3. **Final Exam (20%):**
   Final exam as per University Schedule

Students are encouraged to read the academic honesty policy (Student Standards of Academic Conduct).

Course Outline:

Schedule	Topics	Assignments
January 28	Introduction z-transform Response of a system	
February 4	Stability	HW1
February 11	HW2 assigned at 4pm and due at 6:30pm	HW2 Due 6:30pm
February 18	Controllability	
February 25	Topics discussed in January 29 to February 12	Test 1
February 26	Observability	HW3
March 3	Review of topics discussed in previous weeks	
March 10	Topics include Stability, controllability and observability	Test 2
March 17	State Feedback	HW4
March 24	State Feedback	
March 31	Output Feedback	HW5
April 7	Output Feedback	
April 14	State Feedback and Output Feedback	Test 3
April 17	PID controller	
	Final Exam	