Course	ECE 48300 – Digital Control Systems - Analysis and Design
Type of Course	Elective for CmpE, EE, and ME programs
Catalog Description	Modeling using state-variable representation in discrete-time and z-transfer function. Parameter determination. Extension of basic frequency domain approaches to digital systems design. Time domain design of discrete-time systems. Computational methods emphasized in the design. Basics of computer control.
Credits	3
Contact Hours	3
Prerequisite Courses	ECE 30100 or ME 33100
Corequisite Courses	None
Prerequisites by Topics	An introduction to signals and systems, or system dynamics
Textbook	*Digital Control System Analysis & Design*, by Phillips, Nagle, and Chakrabortty, Pearson, 4th Ed., 2015
Course Objectives	This course provides an introduction to control of discrete-time systems. Both classical and modern control techniques are covered. Implementation of digital controller and computer controlled systems are also discussed.
Course Outcomes	Students who successfully complete this course will have an understanding of:

a. Discrete-time systems representations (1)
b. Introduction to z-transform and state-space techniques (1)
c. Sampling and reconstruction (1)
d. Open loop and closed loop systems (1)
e. Controllability, observability, and stability (1)
f. Time-domain and frequency domain analysis (1)
g. Design using z-transform and state-space descriptions (2)
h. Approximation and implementation of controllers (1)

Lecture Topics	1. Discrete-time systems representations
	2. Z-transform
	3. Sampling and reconstruction
	4. Open loop and closed loop systems
	5. System response characteristics
	6. Frequency domain analysis
	7. Controllability, observability, and stability
	8. Control systems design of discrete-time systems
	9. Approximation and implementation of digital controllers

Computer Usage   High

Laboratory Experience   None

Design Experience   High

Coordinator   TBD

Cross-listed Course   None

Date   10/01/2018