EE463-Digital control systems (Elective Course)

Code and Name: EE 463 Digital control systems
Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:
- Digital Control system Analysis and Design, Charles L. Philips, Fourth Edition, Prentice Hall, 2014.
Other References:
-http://nptel.ac.in/courses

Course Description:
Basic components of a digital control system, Modeling discrete-time systems by pulse transfer function, Stability analysis of discrete time systems, Deadbeat response design, Discrete state space model, State feedback design, Output feedback design, Introduction to optimal digital control systems.

Pre-requisites: EE361
Co-requisites: None

Course Learning Outcomes:
With relation to ABET Student Outcomes (SOs: 1-7)
1. Apply backward and forward differences to convert a continuous time signal into discrete time systems. (1)
2. Design and use the Root Locus method for discrete control systems. (2)
3. Apply the Routh Hurwitz method to determine the stability of digital Control systems. (1)
4. Apply graphical techniques for modelling digital control systems. (1)
5. Calculate various digital control system's steady state errors. (1)
6. Use simulation tools such as LabView for modelling and designing of digital control systems. (6)

Topics to be covered:
-   Modelling discrete-time systems by pulse transfer function.
-   Stability analysis of discrete time systems.
-   Deadbeat response design.
-   Discrete state space model.
-   State feedback design.
-   Output feedback design.
-   Introduction to optimal control.

Grading Policy:
The grading for the course are 60% coursework and 40% Final Exam. The coursework consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, homework, and projects for the remaining 20% that is modified by the course instructor.