CSE 310: CONTROL SYSTEMS

1. COURSE OUTLINE:

This is basic level course on classical control systems. The objective of this course is to give the students firm grasp of the essential principles of linear control systems. This course covers techniques required for analysis and design of controllers for linear time invariant systems in frequency and time domains. The concepts of transfer function, state-space representation, stability, root-locus, Bode plots, RH stability criteria and controller design techniques are covered.

2. WEEKLY COURSE OUTLINE:

Weeks	**Topics**
Week 1	Introduction to LTI systems and control systems
Week 2	Review of Laplace Transform, and analysis of transfer functions
Week 3	State space modeling and Stability of control systems
Week 4	Conversion of transfer functions to state-space models & vice versa
Week 5	Step response analysis and simplification of interconnected systems
Week 6	Routh Hurwitz Analysis
Week 7	Root Locus - part 1
Mid Term Examination	
Week 8	Root Locus - part 2
Week 9	Frequency domain techniques – part 1
Week 10	Frequency domain techniques – part 2
Week 11	Frequency domain controller design techniques
Week 12	Controllability and Observability Analysis
Week 13	State feedback controller design
Week 14	Observer based controller
Week 15	Revision
Final Term Examination	

3. RESOURCES

Primary Text-Book:

- Norman S. Nise, Control Systems Engineering, 6th Edition, Wiley

Reference Book:

- Katsuhiko Ogata, Modern Control Engineering, 5th Edition, Pearson.
- R. C. Dorf. & R. H. Bishop, Modern Control Systems, 12th Edition, Pearson.