CONTROL SYSTEM-III
EE-703B
Credit: 3
Contact: 3L

Module 1
Feedback Linearization:
Motivation, Input–Output Linearization, Full-State Linearization, State Feedback Control and Stabilization.
[05]

Module 2
Sliding Mode Control:
Overview of SMC, Motivating Examples, Stabilization of second order system; Advantages and disadvantages.   [05]

Module 3
Optimal control system:
Formulation of optimal control problem: Minimum time, minimum energy, minimum fuel problem, state regulator, output regulator & tracking problems.

Calculus of variations: Constrained fixed point and variable point problems, Euler Lagrange equations. Problems with equality and inequality constraints. Engineering application, Lagrange, Mayer & Bolza problems, Pontryagin's maximum (minimum) principle.

Multiple decision process in discrete and continuous time - The dynamic programming.

Numerical solution of two point boundary value problems - the steepest descent method and the Fletcher - Powell Method.   [20]

Numerical problems to be solved in the class.

Text Books:
1. Applied Nonlinear control, J.J.E. Slotine & W. Li, Prentice Hall
2. Modern Control theory, M. Gopal, 2nd Edition, New age international publishers.
3. Introduction to control system, D.K. Anand & R.B. Zmood, Asian book Pvt. Ltd.

Reference Books:
1. Adaptive control system, K.J. Astrom and B. Wittenamark, Addision Wesley Publishing Co
2. Nonlinear control systems, Springer Verlag..