PEIXXX: SYSTEM IDENTIFICATION AND CONTROL

L	T	P	Cr
3	0	0	3.0

Process Identification: Analysis of process models, the Laplace transform, input output process model, state space process models, discrete time process models. Models of linear dynamical systems, identification from step responses, first order system, under-damped second order system, system of a higher order. Least squares methods, recursive least square method, modification of recursive least squares, identification of a continuous time transfer function.

Control: Closed loop system, steady state behaviour, control problem indices, PID controller, PID controller structures, set point weighting, rules for controller selection. Optimal process control, problem of optimal control and principle of minimum, feedback Optimal control, optimal tracking servo problem and disturbance, Rejection, dynamical programming, observers and state observers, Analysis of state feedback with observes and polynomial pole Placement. Adaptive control, deterministic self tuning regulators, stochastic and predictive self tuning regulators, model reference adaptive systems, gain scheduling controllers

Course learning outcome (CLO): After the completion of the course the students will be able to

1. Develop input output process model, state space process models, discrete time process models.
2. Use the concept of least square methods and recursive least square method.
3. Solve optimal control problem and design of optimal controller.
4. Design adaptive control system.

Recommended Books:

1. *Process Modelling, Identification and control, J. Mikles and M. Fikar, Springer.*

2. Adaptive Control, K.J. Astrom, PHI.

Evaluation Scheme:

Evaluation Elements	Weightage (%)
MST	30
EST	50
Sessionals (May include Assignments/ Projects/ Tutorials/ Quizes/ Lab Evaluations)	20