CONTROL SYSTEM DESIGN, SIMULATION AND OPTIMIZATION LAB

Course Code: 15CH1148

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Course Outcomes :

At the end of the Course, the Student will be able to:

CO 1 Determine poles & zeros of transfer functions

CO 2 Create Bode plot for the given system & analyze for its stability

CO 3 Design a system using PI & PID controllers

CO 4 Apply SIMULINK tool box for control system design and simulation

CO 5 Formulate and solve linear and nonlinear optimization problems

LIST OF EXPERIMENTS/PROGRAMMES:

Introduction to MATLAB Toolbox.

Control System design using MATLAB control system Toolbox.

1.   Constructing Transfer functions.

2.   Poles and zeros of a Transfer functions.

3.   Bode plots and their analysis.

4.   Inverse response.

5.   Control system design using PI and PID controllers.

6.   Control system simulation using SIMULINK for P, PI and PID Controllers in the closed loop response of first order and second order systems with time delay.

7.   Control system simulation using SIMULINK for P, PI and PID Controllers in the closed loop response of first order and second order systems without time delay.

8. Unconstrained Optimization using MATLAB Optimization Toolbox.

9. Linear Optimization using MATLAB Optimization Toolbox.

10. Constrained Optimization using MATLAB Optimization Toolbox. Design of a PI controller using Optimization technique.