

Course Name: CONTROL SYSTEM-I LABORATORY

Course Code: EE 593

Credit: 2

Prerequisites:

To understand this course, the student must have idea of:

Sl. No.	Subject	Description	Level of Study
01	MATLAB, PSPICE	Programming ,Schematic Diagram	Basic knowledge
02	Circuit Theory Lab	Network Thory	2 nd sem

Course Objectives:

- Will have a strong knowledge on MATLAB software.
- To study the concept of time response and frequency response of the system
- Students get the basic knowledge on practical control system applications on machines & electronic devices.
- This course aims to familiarize with the modeling of dynamical systems ,to simulate and analyze the stability of the system using MATLAB.

Course Outcomes:

At the end of the course, a student will be able to:

1. Discuss the need of software tools (MATLAB, PSPICE) to illustrate modeling and simulation of any system.
2. Classify and evaluate the performance parameters of a system and then with simulation prepare an advance tool to modify the values of the parameter of the system in order to meet the desired need.
3. Prepare professionals in laboratory to compute or to predict the characteristics of a system by visualizing experimental data and its graphical representation.
4. Evaluate possible causes of discrepancy in practical experimental observations in comparison to theory by introducing the concepts of different stability theorems.
5. Primarily via team-based laboratory activities, students will demonstrate the ability to interact effectively on a social and interpersonal level with fellow students, and will develop the ability to divide up and share task responsibilities to complete assignments.

6. Develop professional quality textual and graphical presentations of laboratory data and computational results, incorporating accepted data analysis and synthesis methods, mathematical software, and word-processing tools.

CO- PO mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	2	2	1	-	3	-	1	-	1	2	-	2
2	2	2	-	2	2	1	1	-	1	2	2	2
3	1	2	2	2	1	1	1	-	2	2	1	1
4	2	2	1	2	1	-	2	-	-	2	2	2
5	-	1	1	-	-	2	1	3	3	2	2	1
6	2	2	1	2	2	-	1	2	1	3	2	2

Syllabus Indicating CO:

Module No.	Content	Relevant CO's
1	Familiarization with MAT-Lab control system tool box, MAT-Lab- simulink tool box & PSPICE.	CO1, CO3, CO5, CO6
2	Determination of Step response for first order & Second order system with unity feedback on CRO & calculation of control system specification like Time constant, % peak overshoot, settling time etc. from the response.	CO1, CO4, CO6
3	Simulation of Step response & Impulse response for type-0, type-1 & Type-2 system with unity feedback using MATLAB & PSPICE.	CO1, CO3, CO5, CO6

4	Determination of Root locus, Bode plot, Nyquist plot using MATLAB control system tool box for 2nd order system & determination of different control system specification from the plot.	CO1,CO4,CO5,CO6
5.	Determination of PI, PD and PID controller action of first order simulated process.	CO1,CO2,CO3,CO5
6.	Determination of approximate transfer functions experimentally from Bode plot.	CO1,CO3,CO5,CO6
7.	Evaluation of steady state error, setting time , percentage peak overshoot, gain margin, phase margin with addition of Lead	CO1,CO3,CO5,CO6