Faculty of Electrical Engineering

B.E. Electrical and Electronics Engineering

(R 2021) Semester – V

MAJOR EQUIPMENT

Course Code: EE3512

Course Title: CONTROL AND INSTRUMENTATION LABORATORY

Subject incharge: N.Renukadevi

Sl. No.	Description of Equipment	Required numbers (for batch of 30 students)
1	Desktop	30 Nos.
2	Mat Lab Latest Version	30 User

SAFETY MEASURES

- General Rules of Conduct in Laboratories are displayed.
- Specific Safety Rules for students are displayed.
- Fire Extinguisher and First aid kit are regularly inspected and restocked as necessary.
- All electrical wires are protected by using MCB.
- Well trained technical supporting staff.
- Periodical servicing of the lab equipments.
- Maintaining a clean and organized laboratory.

EE3512 CONTROL AND INSTRUMENTATION LABORATORY LT P C
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COURSE OBJECTIVES:

- To make the students familiarize with various representations of systems.
- To make the students analyze the stability of linear systems in the time domain and frequency domain.
- To make the students design compensator based on the time and frequency domain Specifications.
- To develop linear models mainly state variable model and transfer function model
- To make the students to design a complete closed loop control system for the physical systems.

LIST OF EXPERIMENTS:

1. Analog (op amp based) simulation of linear differential equations.
2. Numerical Simulation of given nonlinear differential equations.
3. Real time simulation of differential equations.
4. Mathematical modeling and simulation of physical systems in at least two fields.
   - Mechanical
   - Electrical
   - Chemical process
5. System Identification through process reaction curve.
6. Stability analysis using Pole zero maps and Routh Hurwitz Criterion in simulation platform.
7. Root Locus based analysis in simulation platform.
8. Determination of transfer function of a physical system using frequency response and Bode's asymptotes.
9. Design of Lag, lead compensators and evaluation of closed loop performance.
10. Design of PID controllers and evaluation of closed loop performance.
11. Discretization of continuous system and effect of sampling.
12. Test of controllability and observability in continuous and discrete domain in simulation platform.
13. State feedback and state observer design and evaluation of closed loop performance.
14. Mini Project 1: Simulation of complete closed loop control systems including sensor and actuator dynamics.
15. Mini Project 2: Demonstration of a closed loop system in hardware.

TOTAL :60 PERIODS

COURSE OUTCOMES:

At the end of this course, the students will demonstrate the ability

CO1: To model and analyze simple physical systems and simulate the performance in analog and digital platform.
CO2: To design and implement simple controllers in standard forms.
CO3: To design compensators based on time and frequency domain specifications.
CO4: To design a complete closed control loop and evaluate its performance for simple physical systems.
CO5: To analyze the stability of a physical system in both continuous and discrete domains.