CONTROL SYSTEMS

Course Objectives:

Objective
1. To understand basic concepts of control systems.
2. Analyze systems in time domain.
3. Understand frequency domain analysis.
4. Understand system stability.
5. Design compensators for control systems.

Programme Outcomes (POs):

Programme Outcome
PO1: Apply knowledge of fundamentals to complex problems.
PO2: Analyze complex engineering problems.
PO3: Design solutions for complex problems.
PO4: Use research methods to provide conclusions.
PSO1: Design and evaluate Electrical systems.
PSO2: Apply technology for Electrical Engineering innovations.

Course Outcomes (COs):

Course Outcome
CO1: Model systems and compute transfer functions.
CO2: Analyze performance and steady state errors.
CO3: Analyze frequency response.
CO4: Examine system stability.
CO5: Design and analyze compensators.

Articulation Matrix:

CO.No.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	3	3	1	3										
2	1	2	3	3		2								
3	2	3	3	3	3									
4	1	4	3	3	3									
5	2	1	3	3	1		2							

Units:

UNIT I: Mathematical Model of Physical Systems (10 Hours):

Basic elements, Open and closed loop systems, Transfer functions, Block diagram reduction, Signal flow graph.

UNIT II: Time Domain Analysis (8 Hours):

Time response, Steady state error, Effects of proportional-derivative-integral systems.

UNIT III: Frequency Domain Analysis (9 Hours):

Frequency response, Bode plot, Polar plot.

UNIT IV: Stability Analysis (9 Hours):

Stability concepts, Routh-Hurwitz criterion, Nyquist criterion, Root Locus technique.

UNIT V: Compensator Design (9 Hours):

Lag, Lead, Lag-Lead compensators, State variable techniques.