

Branch Name:	Electrical Engineering
ProgramCode:	ET213
CourseName:	Modern Control System Practical
CourseCode:	2ET2130103P
Pre-requisiteCourse:	Fundamentals of Control System

Course Objectives:

1. To understand the background of conventional and modern control system for the real time analysis.
2. To learn the role of state space analysis, observer and controller design in the field of control system engineering.
3. To study and analyze nonlinear control systems & its stability techniques.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	-	-	2	2	-	-	-	-	10	25	10	25	50

Course Contents:

Sr. No.	Detail of Practical	Content Hours
1	Introduction to MATLAB for various matrix operations.	04
2	Simulink for various state space models	04
3	MATLAB program for state space representation.	04
4	MATLAB program for controllability and observability.	04
5	MATLAB program for observer design.	04
6	MATLAB problem for controller design.	04
7	MATLAB program for Lyapunov methods.	02
8	MATLAB program for Phase-plane trajectories.	02

Reference Books:

1. Automatic Control Systems, High Education Press, 2003- B. C.Kuo.
2. Control System Engineering (Sixth Edition) by Norman S. Nice ,John Wiley & Sons.
3. Control System Engineering by I. J. Nagrath and M. Gopal, New Age International Publishers.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understand the model of electrical and mechanical systems in statespace.	2 Understanding
CLO2	Design a state-feedback controller and state-feedback observer to meet transient response specifications.	6 Creating
CLO3	Understand the analysis of controllability and observability.	2 Understanding 4 Analyze
CLO4	Derive the describing function for different types of non-linearities and then do the stability analysis.	5 Evaluate 1 Remembering
CLO5	Analyze stability properties of nonlinear systems using Lyapunov stability methods	4 Analyze
CLO6	Know about use of electrical control system in general uses.	2 Understanding

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1				M			L				M		M			L
CLO2			L		M			M		L		M		M	H	
CLO3		L		H		M	L		L		M	M	M			L
CLO4	L			H	L	M				L		M				L
CLO5	L				M			M		L		M		M	H	
CLO6				M			L				M		M			L

H: High, M: Medium, L: Low