

## Lesson Planning

Name of the Institute : CRSSIET SILANI-KESHO, JHAJJAR  
Name of the teacher : Mr. SANDEEP YADAV  
Department : Electrical  
Subject & Code : Control System, PCC-EE-305G  
Branch/Semester : EE 5<sup>th</sup> Semester

Chapter	Topic
Section-A INTRODUCTION:	Industrial control examples,
	Mathematical models of physical systems
	Control hardware and their models,
	Transfer function models of linear time-invariant systems.
	Feedback Control: Open-Loop and Closed-loop systems,
	benefits of feedback, block diagram algebra, signal flow graphs.
	Standard test signals.
	Time response of first and second order systems for standard test inputs.
	Application of initial and final value theorem
	Design specifications for second-order systems based on the time-response
	Concept of Stability Routh-Hurwitz Criteria. Relative Stability analysis.
	Root-Locus technique Construction of Root-loci
Section-B:	Relationship between time and frequency response
	Polar plots
	Bode plots
	Nyquist stability criterion.
	Relative stability using Nyquist criterion
	gain and phase margin
	Closed-loop frequency response.

Section-C	Stability, steady-state accuracy
	transient accuracy, disturbance rejection
	insensitivity and robustness of control systems
	Root-loci method of feedback controller design
	Design specifications in frequency-domain
	Frequency-domain methods of design. Application of 10 Proportional, Integral and Derivative Controllers
	Lead and Lag compensation in designs
	Analog and Digital implementation of controllers.
Section D	Concepts of state variables
	State space model. Diagonalization of State Matrix
	Solution of state equations
	Eigenvalues and Stability Analysis
	Concept of controllability
	Concept observability.