

**Department of Electronics and Communication Engineering****Bhoj Reddy Engineering College for Women: Hyderabad**

Lesson Plan of Faculty member for the Academic year 2015- 16

Name of the faculty member: A.Navila

Class: III B.Tech. ECE A

Subject: Control Systems Engineering

Semester: I

No. of lectures per week: 4+1

Lecture Number	Date(s)	Topic to be covered
<b>UNIT – I: INTRODUCTION</b>		
1.	29/06/15	Concepts of Control Systems-
2.	1/07/15	Open Loop and closed loop control systems and their differences-
3.	3/07/15	Different examples of control systems- Classification of control systems
4.	4/07/15	Feed-Back Characteristics, Effects of feedback
5.	30/06/15, 01/07/15,03/07/15	Tutorial(G1,G3,G2)problems on transfer function
6.	6/07/15	Impulse Response and transfer functions -
7.	8/07/15	Mathematical models – Differential equations
8.	10/07/15	Translational mechanical systems
9.	11/07/15	Rotational mechanical systems
10.	7/07/15,8/07/15,10/7/15	Tutorial(G1,G3,G2) problems on mechanical model
11.	13/07/15	Block diagram representation of systems
12.	15/07/15	Block diagram reduction
13.	17/07/15	Block diagram algebra
14.	14/7/15,15/07/15, 17/07/15	Tutorial(G1,G3,G2) problems on block diagram reduction
15.	20/07/15	Representation by Signal flow graph
16.	22/07/15	Reduction using mason's gain formula
17.	24/07/15	Block diagram representation of systems
18.	25/07/15	Block diagram algebra
19.	21/07/15,22/07/15, 24/7/15	Tutorial(G1,G3,G2) problems on signal flow graph
<b>UNIT-II TIME RESPONSE ANALYSIS</b>		
20.	27/07/15	Standard test signals
21.	29/07/15	Time response of first order systems
22.	31/07/15	Characteristic Equation of Feedback control systems
23.	01/08/15	Transient response of second order systems
24.	28/07/15,29/07/15, 31/07/15	Tutorial(G1,G3,G2) problems on related topic
25.	03/08/15	Time domain specifications,Steady state response
26.	05/08/15	Steady state errors and error constants
27.	07/08/15	Effects of proportional derivative
28.	08/08/15	Proportional integral systems : PD Systems
29.	4/08/15,05/08/15, 07/08/15	Tutorial(G1,G3,G2) problems on Steady state response
30.	12/08/15	Proportional integral systems : PI, PID Systems
31.	14/08/15	Standard test signals
32.	11/08/15,12/08/15, 14/08/15	Tutorial(G1,G3,G2) problems on related topic
<b>UNIT – III STABILITY ANALYSIS IN S-DOMAIN</b>		
33.	17/08/15	The concept of stability ,Routh's stability criterion

34.	19/08/15	Qualitative stability and conditional stability
35.	21/08/15	Root locus concept, Construction of root loci
36.	22/08/15	Effects of adding poles and zeros to $G(s)H(s)$ on the root loci.
37.	18/08/15, 19/08/15, 21/08/15	Tutorial( $G1, G3, G2$ ) problems on Root locus concept
<b>UNIT – IV FREQUENCY RESPONSE ANALYSIS</b>		
38.	31/08/15	Introduction, Frequency domain specifications
39.	02/09/15	Bode diagrams
40.	04/09/15	Bode diagrams
41.	05/09/15	Determination of Frequency domain specifications and transfer function from the Bode Diagram
42.	01/09/15, 02/09/15, 04/09/15	Tutorial( $G1, G3, G2$ ) problems on related topic
43.	07/09/15	Stability Analysis from Bode Plots
44.	09/09/15	Stability Analysis from Bode Plots
45.	11/09/15	Stability Analysis from Bode Plots
46.	12/09/15	Polar Plots
47.	8/09/15, 09/09/15, 11/09/15	Tutorial( $G1, G3, G2$ ) problems on Bode Plots
48.	14/09/15	Nyquist Plots
49.	16/09/15	Applications of Nyquist criterion to find the stability
50.	18/09/15	Effects of adding poles and zeros to $G(s)H(s)$ on the shape of the Nyquist diagram
51.	19/09/15	Effects of adding poles and zeros to $G(s)H(s)$ on the shape of the Nyquist diagram
52.	15/09/15, 16/09/15, 18/09/15	Tutorial( $G1, G3, G2$ ) problems on Polar Plots and Nyquist Plots
53.	21/09/15	Compensation techniques
54.	23/09/15	Lag Controllers design in frequency Domain
55.	25/09/15	Lag Controllers design in frequency Domain
56.	26/09/15	Lead Controllers design in frequency Domain
57.	22/09/15, 23/09/15, 25/09/15	Tutorial( $G1, G3, G2$ ) problems on related topic
58.	28/09/15	Lead-Lag Controllers design in frequency Domain
59.	30/09/15	Lead-Lag Controllers design in frequency Domain
60.	03/10/15	PID Controllers.
61.	05/10/15	PID Controllers.
62.	29/09/15, 30/09/15, -----	Tutorial( $G1, G3,$ ) problems on controller
<b>UNIT – V STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS</b>		
63.	06/10/15	Concepts of state
64.	9/10/15	State variables and state model
65.	10/10/15	Derivation of state models from block diagrams
66.	06/10/15 09/10/15 10/10/15	Tutorial( $G1, G3, G2$ ) problems on state model
67.	13/10/15	Diagonalization
68.	16/10/15	Solving the Time invariant state Equations
69.	17/10/15	State Transition Matrix and it's Properties
70.	13/10/15, 14/10/15, 16/10/15	Tutorial( $G1, G3, G2$ ) problems on transition matrix and problems on previous question papers

**TEXT BOOKS:**

1. Automatic Control Systems 8<sup>th</sup> edition – by B.C.Kuo 2003 – John wiley and son's
2. Control Systems Engineering – by I.J.Nagrath and M.Gopal, New Age International (P) Limited Publishers, 2<sup>nd</sup> edition.

**REFERENCE BOOKS:**

7. Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt.Ltd., 3<sup>rd</sup> edition, 1998.
8. Control Systems by N.K.Sinha, New Age International (P) Limited Publishers, 3<sup>rd</sup> edition, 1998.
9. Control Systems Engg. By NISE 3<sup>rd</sup> edition – John wiley.
10. “Modelling and Control of Dynamic Systems” by Narciso F.Macia George J.Thaler, Thomson Publishers.

**Name of the faculty:** A.Navila

**Signature of the faculty:**

**Signature of the Head:**