

Bhoj Reddy Engineering College for Women: Hyderabad
Department of Electrical and Electronics Engineering
 Lesson plan of faculty member for the academic year 2016–17
 Class: III B Tech Branch: EEE Semester: I
 Subject: Control Systems Lectures per week: 4+1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
UNIT-I: Introduction		
1	Introduction to control systems	13 June 2016
2	Introduction to open loop and closed loop control systems	16 June 2016
3	Differences, examples of control systems ,Classification of control systems	17 June 2016
4	Feedback Characteristics, and effects	18 June 2016
5	Tutorials (G2, G1, G3) - Problems related to Feedback Characteristics	14, 16, 18 June 2016
6	Control over system dynamics by the use of feedback	20 June 2016
7	Numericals	23 June 2016
8	Mechanical, rotational systems, translational system's transfer function Numerical sums	24 June 2016
9	Mathematical model of physical systems, differential eqs,transfer functions	25 June 2016
10	Tutorials (G2, G1, G3) - Problems related to Mathematical model	21, 23, 25 June 2016
11	Mechanical rotational systems, transfer function Numericals, Electrical analogous system, F-V & F-I	27 June 2016
12	Numericals	30 June 2016
13	Mechanical rotational systems, transfer function Numericals, Electrical analogous system, T-V & T-I	1 July 2016
14	Numericals	2 July 2016
15	Tutorials (G2, G1, G3) - Problems related to analogous systems	28, 30 June 2016, 2 July 2016
UNIT-II: Transfer Function Representation		
16	Explanation of block diagram algebra rules	4 July 2016
17	Block diagram representations, examples Transfer functions	8 July 2016
18	Numericals	9 July 2016
19	Tutorials (G1, G3) – Problems related to Block diagrams	5, 9 July 2016
20	Reduction –numerical	11 July 2016
21	Rules-Representation of signal flow graphs	14 July 2016
22	Reduction using Mason's gain formulae	15 July 2016
23	Numericals	16 July 2016
24	Tutorials (G2, G1, G3) - Problems related to SFG	12, 14, 16 July 2016
25	Explanation of DC Servomotor transfer function(both armature and field controlled)	18 July 2016
26	AC Servomotor Explanation &Transfer function Derivation Synchro Transmitter and Receiver & transfer function derivation	21 July 2016
27	Synchro Transmitter and Receiver & transfer function derivation	22 July 2016
28	Numericals	23 July 2016

29	Tutorials (G2, G1, G3) - Problems related to SFG	19, 21, 23 July 2016
UNIT-III: Time Response Analysis		
30	Time response of First order Systems	25 July 2016
31	Second order system response	28 July 2016
32	Numericals	29 July 2016
33	Transient response of second order systems	30 July 2016
34	Tutorials (G2, G1, G3) - Problems related to Time response	26, 28, 30 July 2016
35	Time domain specifications,	4 August 2016
36	Steady state errors ,type ,error constants	5 August 2016
37	Numericals	6 August 2016
38	Tutorials (G2, G1, G3) - Problems related to error	2, 4, 6 August 2016
39	Effects of PD controller	18 August 2016
40	Effects of PI, PID controllers	19 August 2016
41	Numericals	20 August 2016
42	Tutorials (G2, G1, G3) - Problems related to PID	16, 18, 20 August 2016
UNIT-IV: Stability Analysis in S-Domain		
43	Concepts of Stability, Qualitative & conditional stabilities	22 August 2016
44	Routh stability criterion	26 August 2016
45	Numericals	27 August 2016
46	Tutorials (G1, G3) – Problems related to RH criterion	23, 27 August 2016
47	Root locus concept	29 August 2016
48	Root Locus rules	1 September 2016
49	Construction of root loci	2 September 2016
50	Numericals	3 September 2016
51	Tutorials (G2, G1, G3) - Problems related to root loci	30 August 2016, 1, 3 September 2016
52	Effects of adding poles and zeroes to $G(s)H(s)$ on the root loci	8 September 2016
53	Numericals	9 September 2016
54	Numericals	10 September 2016
55	Tutorials (G2, G1, G3) - Problems related to root loci	6, 8, 10 September 2016
UNIT-V: Frequency Response Analysis		
56	Frequency response analysis, specifications ,advantages	15 September 2016
57	Derivations of r , k_g M_r , ω_l correlation ,bode plot introduction	16 September 2016
58	Correlation between time domain & frequency domain	17 September 2016
59	Tutorials (G2, G1, G3) - Problems related to frequency domain	13, 15, 17 September 2016
60	Bode plot introduction	19 September 2016
61	Bode plot for constant K, differentiator, integrator and first order factor in numerator and denominator	22 September 2016
62	Bode plot for Quadratic factor in numerator and denominator	23 September 2016
63	Procedure for magnitude & phase vs frequency plot	24 September 2016
64	Tutorials (G2, G1, G3) - Problems related to Bode plot	20, 22, 24 September 2016
65	Construction of Bode pot	26 September 2016
66	Numericals	29 September 2016
67	Gain margin, Phase margin, gain crossover frequency and phase crossover frequency	1 October 2016
68	Tutorials (G2, G1, G3) - Problems related to GM	27,29 September 2016, 1 October 2016
69	Finding phase margin and gain margin adjustment, stability	3 October 2016
70	Tutorial (G1) – Problems related to PM	4 October 2016
71	Numericals	27 October 2016
72	Finding Transfer function from Bode plot	28 October 2016

73	Numericals	29 October 2016
74	Tutorials (G2, G3) – Problems related to stability	28, 29 October 2016
75	Revision	31 October 2016
76	Revision	3 November 2016
77	Tutorials (G2, G1)	31 October 2016, 3 November 2016

Text Books:

1. Control systems theory and applications-S.K.Bhattacharya, Pearson.
2. Control Systems -N.C.Jagan, BS Publications.
3. Control Systems Engineering –S.Palani, Tata-McGraw-Hill.
4. Control Systems by A.Anand Kumar ,PHI.
5. Control Systems -N.K.Sinha,New Age International (P)limited publishers
6. Control Systems Engineering-I.J. Nagrath and M.Gopal, New Age International (P) limited publishers
7. Control Systems -Dhanesh N.Manik, Cengage Learning

Name and signature of the faculty: Mr B Laxman

Name and signature of Head of the Department: Ms Y Mastanama
