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-Section: EEE Semester: I

Subject: Power Electronics (PE) Lectures per week: 4+1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
UNIT – I : Power Semi-Conductor Devices And Commutation Circuits		
1	Introduction to Power electronics BJT, Power MOSFET Characteristics	13 June 2016
2	Power IGBT Characteristics, Numerical problems	16 June 2016
3	Other members of Thyristor family and their characteristics	17 June 2016
4	Basic theory of operation of SCR and static characteristics.	18 June 2016
5	Tutorial(G3,G1,G2)-Problems on BJT	13,14,16 June 2016
6	Salient points of SCR operation and two transistor analogy; Problems	20 June 2016
7	Turn on methods of SCR and turn off methods	23 June 2016
8	Dynamic characteristics of SCR – turn on & turn off times	24 June 2016
9	Two transistor analogy SCR-UJT firing circuits	25 June 2016
10	Tutorial(G3,G1,G2)-Problems on Two transistor analogy SCR	20,21,23 June 2016
11	Series and parallel connection of SCRs;	27 June 2016
12	Specifications and ratings of SCR,BJT,IGBT	30 June 2016
13	Snubber circuit details and design of snubber	1 July 2016
14	Problems in snubber circuit design	2 July 2016
16	Tutorial(G3,G1,G2)-Problems on Snubber circuit	27,28,30 June 2016
17	Line commutation and forced commutation circuits; Numerical problems	4 July 2016
UNIT – II : AC-DC Converters(1-Phase & 3-Phase Controlled Rectifiers)		
18	Phase control technique of line commutated converter	8 July 2016
19	1 phase midpoint and bridge connections of converters	9 July 2016
20	Tutorial(G3,G1)-Problems on Phase control technique	4,5 July 2016
21	Single phase half controlled converter with R, RL and RLE Load derivation of average voltage and average current.	11 July 2016
22	Derivation of average voltage and average current; Numerical problems	14 July 2016
23	Active and Reactive power inputs to the converters without and with freewheeling Diode	15 July 2016
24	Single phase fully controlled converters, Mid-point and Bridge connections with R,RL load and RLE load	16 July 2016
25	Tutorial(G3,G1,G2)-Problems on Single phase fully controlled converters	11,12,14 July 2016
26	Derivation of average load voltage and current	18 July 2016
27	Line commutated inverters; Numerical problems	21 July 2016
28	Active and reactive power inputs to the converters without and with freewheeling Diode, Effect of source inductance	22 July 2016
29	Derivation of load voltage and current	23 July 2016
30	Tutorial(G3,G1,G2)-Problems on Active and reactive power of a Converters	18,19,21 July 2016
31	Three phase three pulse , six pulse converters	25 July 2016

32	Three phase midpoint and bridge connections; Numerical problems on three phase and single phase converter	28 July 2016
33	Three phase half controlled converter with R,RL load Derivations of average load voltage	29 July 2016
34	Effect of source inductance; Dual converters (both single phase and three phase) wave forms	30 July 2016
35	Tutorial(G3,G1,G2)-Problems on Effect of source inductance	25,26,28 July 2016
UNIT – III : DC-DC Converters(Choppers)		
36	Time ratio control & current limit control strategies	4 August 2016
37	Step up/down chopper, Derivation of load voltage and current with R, RL, RLE loads; Numerical problems	5 August 2016
38	Load expression of step up chopper;	6 August 2016
39	Tutorial(G1,G2)-Problems on step up chopper	2,4 August 2016
40	Principle of operation of Morgan's chopper	18 August 2016
41	Jones chopper and Oscillation chopper	19 August 2016
42	AC Chopper, Voltage commutated chopper and Current commutated chopper with waveforms	20 August 2016
43	Tutorial(G1,G2)-Problems on AC Chopper	16,18 August 2016
UNIT – IV : AC-AC Converters(Ac Voltage Controllers) & Frequency Changers(Cyclo-Converters)		
44	Single phase Ac voltage controllers two SCR's in anti-parallel with R and RL loads; Numerical problems	22 August 2016
45	Operation of TRIAC with R and RL loads	26 August 2016
46	Derivation of RMS load voltage , RMS current and Power Factor	27 August 2016
47	Tutorial(G3,G1)-Problems on Power Factor	22,23 August 2016
48	Single phase midpoint cyclo converter with R load ; Numerical problems	29 August 2016
49	Single phase midpoint cyclo converter with R-L load	1 September 2016
50	Bridge configuration of single phage cyclo-converter(principle of operation only)	2 September 2016
51	Firing circuits Basic parallel capacitor inverter	3 September 2016
52	Tutorial(G3,G1,G2)-Problems on Capacitor Inverter	29,30 August, 1 September 2016
UNIT – V : DC-AC Converters(Inverters)		
53	Inverters, single phase Inverter	8 September 2016
54	Single phase basic series inverter	9 September 2016
55	Single phase basic parallel inverter	10 September 2016
56	Tutorial(G1,G2)-Problems on Parallel Inverter	6,8 September 2016
57	Introduction to Mc Murray- Mc Murray inverter	15 September 2016
58	Bed ford inverter	16 September 2016
59	Operation of Mc Murray- Mc Murray inverter, Numerical problems	17 September 2016
60	Tutorial(G1,G2)-Problems on Series Inverter	13,15 September 2016
61	Numerical problems	19 September 2016
62	Voltage control techniques for inverters	22 September 2016
63	Pulse width modulation techniques	23 September 2016
64	Three phase inverters() degrees conduction modes of operation	24 September 2016
65	Tutorial(G3,G1,G2)-Problems on Voltage control Techniques	19,20,22 September 2016
66	Revision of unit I	26 September 2016

67	Assessment of class test performance	29 September 2016
68	Revision of unit II	1 October 2016
69	Tutorial(G3,G1,G2)-Problems on PWM Techniques	26,27,29 September 2016
70	Assessment of class test performance	3 October 2016
71	Tutorial(G3,G1)-Problems on Cyclo converter	3,4 October 2016
72	Revision of unit III	27 October 2016
73	Assessment of class test performance	28 October 2016
74	Revision of unit IV	29 October 2016
75	Tutorial(G2)-Problems on A.C Voltage Regulator	27 October 2016
76	Assessment of class test performance	31 October 2016
77	Revision of unit V	3 November 2016
78	Tutorial(G3,G1)-Problems on Inverters	31 October ,1 November 2016

Text Books:

1. Power Electronics–M.D.Singh & K.B.Kanchandhani,Tata Mc Graw–Hill Publishing Company, 1998.
2. Power Electronics Devices, Circuits and Industrial Applications-V.R.Moorthi,Oxford University Press.
3. Power Electronics – Vedam Subramanyam, New Age International (P) Limited, Publishers.
4. Thyristorised Power Controllers – G.K.Dubey, S.R.Doradra, A Joshi and R.M. Sinha, New Age International (P) Limited Publishers, 1996.
5. Power Electronics – P.C.Sen, Tata Mc Graw-Hill Publishing.

Name and signature of the faculty: SK Vali ----

Name and signature of Head of the Department: Y.Mastanamma ----