Bhoj Reddy Engineering College for Women: Hyderabad

Department of Electrical and Electronics Engineering

Lesson plan of faculty member for the academic year 2020–21

Class: IV B Tech Branch-Section: EEE Semester: I

Subject: Modern Power Electronics (MPE) Lectures per week: 3

Lecture Number	Topics to be covered	Date (s)
UNIT – I : High Power Semiconductor devices		
1	Introduction to Modern Power Electronics	01 September 2020
2	High power switching devices	03 September 2020
3	Diodes	05 September 2020
4	Silicon controlled rectifiers	08 September 2020
5	Gate turn-OFF Thyristor	10 September 2020
6	Gate commutated thyristor	12 September 2020
7	Insulated gate bipolar transistor	15 September 2020
8	Other switching devices	17 September 2020
9	Operation of series connected devices	19 September 2020
10	Main causes of voltage unbalance	22 September 2020
11	Voltage equalization of GCTs	24 September 2020
UNIT – II : Cascaded H-Bridge Multilevel inverters		
12	Introduction to multilevel inverters	26 September 2020
13	Sinusoidal PWM Technique	29 September 2020
14	Modulation Scheme of PWM Techniques	01 October 2020
15	Harmonic content	03 October 2020
16	Over modulation	06 October 2020
17	Third harmonic injection PWM	08 October 2020
18	Space vector modulation	10 October 2020
19	Switching States , Space vectors	13 October 2020
20	Dwell Time calculation	15 October 2020
21	Modulation index, switching sequence	27 October 2020
22	Spectrum analysis	29 October 2020
23	Even order harmonic elimination	31 October 2020
24	Discontinuous space vector modulation	10 November 2020
25	Introduction, H-Bridge Inverter,	12 November 2020
26	Bipolar Pulse-Width Modulation, Unipolar Pulse-Width Modulation.	17 November 2020
UNIT – III : Diode-Clamped Multilevel Inverters		
27	Three-Level Inverter, Converter Configuration	19 November 2020
28	Switching State ,Commutation	21 November 2020
29	Space Vector Modulation, Stationary Space Vectors	24 November 2020
30	Dwell Time Calculation	26 November 2020
31	Relationship Between V_refLocation and Dwell Times	28 November 2020
32	Switching Sequence Design, Inverter Output Waveforms and Harmonic Content	01 December 2020
33	Even-Order Harmonic Elimination	03 December 2020
34	Neutral-Point Voltage Control, Causes of Neutral-Point Voltage Deviation	05 December 2020
35	Effect of Motoring and Regenerative Operation, Feedback Control of Neutral-Point Voltage	08 December 2020
UNIT – IV : DC-DC Switch-Mode Converters & Switching DC Power Supplies		
36	Control of dc-dc converter, Buck converter, boost converter, buck-boost converter	10 December 2020

37	Cuk dc-dc converter, full bridge dc-dc converter, dc-dc converter comparison.	12 December 2020
38	Introduction, linear power supplies, overview of switching power supplies, dc-dc converters with electrical isolation	15 December 2020
39	Power supply protection, and electrical isolation in the feedback loop, designing to meet the power supply specifications	17 December 2020
UNIT – V : Resonant Converters & Power Conditioners And Uninterruptible Power Supplies		
40	Classification of resonant converters, basic resonant circuit concepts	19 December 2020
41	Load-resonant converters, resonant-switch converters	22 December 2020
42	Zero-voltage-switching, resonant-dc-link inverters with zero-voltage switching's	24 December 2020
43	High frequency-link integral-half cycle converters	29 December 2020
44	Power line disturbances, Introduction to Power Quality, power Conditioners	31 December 2020
45	Uninterruptible power supplies, Applications	02 January 2021

Text Books:

1. Power electronics circuits, Devices and applications - M. H. Rashid, PHI, I edition – 1995.

2. Power Electronics converters, Applications and Design - Ned Mohan, Tore M. Undeland and William P. Robbins - John Wiley & Sons, Inc., Publication, 3rd Edition 2003

3. Power Electronics Devices, Circuits and Industrial Applications-V.R.Moorthi,Oxford University
4. Thyristorised Power Controllers – G.K.Dubey, S.R.Doradra, A Joshi and R.M. Sinha, New Age International (P) Limited Publishers, 1996.

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

Name and signature of Head of the Department: R Manju Bhargavi ----