

VIKASH INSTITUTE OF TECHNOLOGY, BARGARH			
LESSON PLAN			
Semester: 4TH		Year: 2ND	Course: B.Tech
Branch : EEE		Sub: POWER ELECTRONICS	Total Credit:03
		Sub Code : EEPC2005	
Name of the Faculty:		AMIT KUMAR MEHER	
Designation :		LECTURER	
Department :		ELECTRICAL AND ELECTRONICS ENGINEERING	
Session		2024-25	
Recommended Books		Text book:	
		1. Power Electronics By P.S. Bimbhra	
		2. Power Electronics-Devices, Circuits, and Applications By Muhammad H. Rashid	
		Reference Books:	
		1. Power Electronics, Converters, Applications, and Design By Ned Mohan, T. M. Undeland, W. P. Robbins	
		2.Power Electronics By Daniel W. Hart	
Sl. No.	Lecture No.	Topics to be covered	No. of Classes
MODULE-1			
1	Lecture-01	Power Semiconductor Devices and Uncontrolled Rectifiers: Introduction, working and characteristics of power diodes – power transistors – power MOSFETs – IGBTs.	6
2	Lecture-02	Uncontrolled Single-phase Half-wave – Full-wave – Bridge rectifiers,	
3	Lecture-03	Three-phase Half-wave and Bridge rectifiers, performance parameters, and waveform analysis for R and RLloads.	
4	Lecture-04	Thyristors, static I-V characteristics, turn-on methods, Gate characteristics, two transistor model of Thyristor,	
5	Lecture-05	Ratings of Thyristors, Thyristor protection, Design of Snubber circuits, Series and Parallel operation of Thyristors	
6	Lecture-06	Thyristor commutation techniques: Natural and Forced commutation.	
MODULE-2			
7	Lecture-07	Phase Controlled Rectifiers: Principle of Phase control Controlled Single-phase Half-wave rectifier	8
8	Lecture-08	Full-wave converters, Full-wave Bridge converters	
9	Lecture-09	Semiconverter, Full converter, analysis with continuous and discontinuous current conduction	
10	Lecture-10	Performance parameters, and waveform analysis for R – RL – RLE loads, operation with and without free-wheeling diodes.	
11	Lecture-11	Controlled Three-phase Half-wave converter	
12	Lecture-12	Full-wave converters, Full-wave Bridge converter, Semiconverter	
13	Lecture-13	Full converter, performance parameters and waveform analysis for R – RL – RLE loads,	

14	Lecture-14	Dual converter, effect of source impedance on performance of converters.	
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MODULE-3			
15	Lecture-15	DC to DC Converters: Principle of step-down and step-up operation, control strategies, generation of duty cycle	4
16	Lecture-16	Buck, Boost, Buck-Boost, performance parameters, and waveform analysis.	
17	Lecture-17	Types of chopper circuits: first-quadrant, second-quadrant, two-quadrant,	
18	Lecture-18	Four-quadrant choppers, thyristor chopper circuits	
MODULE-4			
19	Lecture-19	DC to AC Converters:Principle of operation, Single-phase Voltage source Bridge inverter	6
20	Lecture-20	Three-phase Bridge inverter, 180-degree conduction	
21	Lecture-21	120-degree conduction, performance parameters, and waveform analysis, Introduction to Current Source Inverter.	
22	Lecture-22	Voltage control of single-phase inverter, pulse-width modulation	
23	Lecture-23	Single pulse width modulation, sinusoidal pulse width modulation.	
24	Lecture-24	Voltage control of three-phase inverters, sinusoidal PWM	
MODULE-5			
25	Lecture-25	AC to AC converters and Drives: AC voltage controllers: principle of phase control, principle of integral cycle control	6
26	Lecture-26	Singlephase full wave voltage controllers with R and RL loads	
27	Lecture-27	Performance parameters and waveform analysis.	
28	Lecture-28	Cyclo converters: single phase Cyclo converters	
29	Lecture-29	Performance parameters and waveform analysis.	
30	Lecture-30	Introduction of Power Electronics application in Electric Drives.	

Signature of Faculty Member

Signature of HOD

PRINCIPAL