VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY

BURLA, ODISHA

Semester: 6TH Bachelor of Technology Session: 2016-17

Subject: Power Electronics (Theory)

Branch: Electrical Engineering, Name of Faculty: Pratyush Pratik

Period	Module no.	Topics to be covered
1	I	Thyristors, Static V-I Characteristics of SCR
2	I	TRIAC, GTO & IGBT
3	I	Turn-On & Turn-OFF Mechanism of SCR, Gate Turnoff Thyristor (GTO)
4	I	Power BJTs . Power MOSFETs - Insulated Gate Bipolar Transistors(IGBTs) - Basic Structure and VI Characteristics
5	I	Static, dynamic and thermal characteristics
6	I	Protection, cooling and mounting techniques
7	I	Series and Parallel operation of devices
8	I	Triggering and basics of driver circuits
9	I	Different types of commutation schemes: Natural and Forced commutation
10	II	1-Phase Half & Full Wave Controlled Rectifier with various kinds of loads (R, R-L-E (motor))
11	II	Midpoint and Bridge type converters
12	II	Half Controlled and Fully Controlled Bridge circuits
13	II	different waveforms, Input Line Current Harmonics, Power factor, current distortion and displacement factors
14	II	Inverter Mode of Operation
15	II	Continuous and discontinuous modes
16	II	Effect of source inductance assuming constant load current
17	II	Effect of freewheeling diode
18	II	Three phase bridge converters for different types of load with constant load current, different waveforms
19	II	180 and 120 degree operations
20	III	DC-DC Converters: Classification of types of choppers
21	III	One, Two and Four quadrant operations
22	III	Step up and down choppers
23	III	Analysis of Type-A chopper
24	III	Single-and two quadrant operation with DC motor load
25	III	AC-AC Converters: Single-phase mid-point Cyclo-converters
26	III	Bridge types of step-up and step-down Cyclo-converters
27	III	Single phase AC Voltage regulators and its basic analysis
28	IV	Single-phase Half and Full bridge Inverter,
29	IV	Pulse Width Modulated (PWM) technique for voltage control, SPWM

		Technique 1-phase inverters
30	IV	, Auxiliary Commutated (Mc-Murray) and Complementary Commutated (Mc-Murray Bedford) Inverters
31	IV	, Three-phase Voltage Source Bridge type of Inverters. (120 and 180 Degree conduction modes)
32	IV	Current Source Inverter. Applications: UPS, SMPS
33	IV	, Induction Heating, Electronic Ballast, AC/DC drives speed control.

Signature of Faculty

Signature of HOD