

The Maharaja Sayajirao University of Baroda Polytechnic Diploma in Electronics & Communication Engg. (HPP)			ACADEMIC YEAR	
Year	III	INDUSTRIAL ELECTRONICS (ELE3520)	Lecture /Lab Hrs per week	4/2
Semester	I		Max marks	100
Pre-Requisite: Basic Electronics, Solid state devices				
CO1	Explain power electronic devices, their switching characteristics, protection, and commutation.			
CO2	Analyze single- and three-phase rectifiers to determine voltage, current, ripple, and efficiency.			
CO3	Evaluate AC–AC controllers using phase-control and frequency-control methods.			
CO4	Assess buck, boost, and buck-boost choppers and their SMPS applications.			
CO5	Describe inverter types and AC motor drive control methods.			
BT	1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation			
COURSE CONTENT/SYLLABUS				
Unit	Unit Name	Hrs	Weightage	CO
1	POWER ELECTRONICS DEVICES Power electronics devices such as, Power DIODE, MOSFET, IGBT, SCR, TRIAC, DIAC, GTO, ETU, construction, working and switching characteristics. Protection of the devices,Firing and gate drive circuits Commutation.	12	20	CO1
2	UNCONTROLLED RECTIFIER (USING DIODE) Single phase half wave and full wave rectifiers,Three phase half wave and full wave rectifiers, Equation of voltage, current, ripple factor, efficiency, and waveforms and related example CONTROLLED RECTIFIER (USING SCR) Single phase half wave rectifiers ,Equation of voltage, current, ripple factor, efficiency, and waveforms and related example Single phase Full Wave Controlled rectifier.Equation of voltage, current, ripple factor, efficiency, and waveforms and related example Three phase half wave rectifiersEquation of voltage, current, ripple factor, efficiency, and waveforms and related example	14	25	CO2
3	AC TO AC CONTROLLER Phase control method,Frequency control method,Applications and related example	8	14	CO3
4	CHOPPERS Classification of chopper,Buck, Boost and buck-boost type of Chopper applications. Switch mode power supply	6	13	CO4
5	INVERTERS Types of Inverters and its application in UPS	6	8	CO5
6	Drives: AC drives (for Induction motor stator side and rotor side)	10	20	CO5
		56	100	
REFERENCE BOOKS:				
1.	Power Electronics by M.H Rashid			
2.	Power Electronics By M.D.Singh			
3.	Semiconductor Physics By Ned Mohan			