

# GUJARAT TECHNOLOGICAL UNIVERSITY

Electronics Engineering / Electronics & Communication  
Engineering / Electronics & Telecommunication Engineering

## B. E. SEMESTER: VII

Subject Name: **Power Electronics**

Subject Code: **171002**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
2	0	2	4	70	30	30	20

Sr. No	Course Content	Total Hrs.
1.	<b>Power semiconductor devices:</b>  Introduction, Power Diodes, Power BJT, Thyristor Characteristics, Two Transistor model of Thyristor, Series and Parallel operation of Thyristors, Power MOSFET, GTO, IGBT, SIT- Device Structures and Characteristics, Handling precautions and power dissipation in all these devices, Turn ON-Turn OFF methods and Circuits, Protections, Ratings and applications, Handling precautions and power dissipation in all these devices..	8
2.	<b>Controlled Rectifiers:</b>  Controlled Rectifiers, Single phase power circuits, Three phase controlled rectifier circuits, Analysis of Controlled Rectifiers with resistive and inductive load and speed control of motors.	6
3.	<b>DC Chopper:</b>  Introduction, Principle of operation, analysis with waveforms of Step-Down and Step-Up choppers, buck, boost and buck-boost Converter. Chopper classifications, Chopper control of motors	6
4.	<b>Invertors:</b>  Principal of Operation of Pulse Width Modulated Inverters, Performance Parameters, Single Phase and Three Phase Bridge Inverters.	5

5.	<b>Applications:</b> Uninterruptible Power Supply, Switched mode Power Supply, RF Heating, Battery Charger.	5
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**Text/Reference Books:**

1. Power Electronics – Circuit, Devices and Applications, M. Rashid, Pearson Education
2. Power Electronic, M.D. Singh and Khanchandani, Tata McGraw Hill Publications.
3. Power Electronics: Essential and Applications, L. Umanand, wiley India pvt.Ltd.
4. Power Electronics: Joseph Vithyathil , Tata McGraw Hill Publications