

GUJARAT TECHNOLOGICAL UNIVERSITY
ELECTRICAL ENGINEERING
B. E. SEMESTER: VII

Subject Name: **Advanced Power Electronics- I (Department Elective-I)**

Subject Code: **170906**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
4	0	2	6	70	30	30	20

Sr. No.	Course Contents	Total Hrs
1.	<p>Resonant Pulse Inverters :</p> <p>Introduction, Classification, Series resonant, Parallel resonant inverter, Class E resonant inverter/rectifier, Zero current / Zero voltage resonant converter, Comparison between ZCS and ZVS, Two quadrant ZVS converter, Resonant dc link inverters, Inverters for UPS.</p>	08
2.	<p>Multi-level converters:</p> <p>Bridge inverters, Need for multi-level inverters, Concept of multi-level, Topologies for multi-level: Diode Clamped, Flying capacitor and Cascaded multi-level configurations; Features and relative comparison of these configurations; Switching device currents; DC-link capacitor voltage balancing, features of multi-level converters, Applications.</p>	08
3.	<p>Multi-pulse converters</p> <p>Concept of multi-pulse, Types of multi-pulse converters, different transformer connections for multi-pulse converters, Applications of multi pulse converters.</p>	06
4.	<p>Power Supplies:</p> <p>Dc Power Supplies: Switched-Mode DC Power Supplies, Fly back converter, Forward converter, Push pull converter, Half bridge converter, full bridge converter, resonant DC power supplies, Bidirectional power supplies.</p> <p>Ac Power Supplies: Switch Mode AC Power supplies, Resonant AC Power supplies, Bidirectional AC Power supplies</p>	10

	UPS: on line, off line, line interactive, chargers, inverters, transfer switch, transformer, control, design etc.,	
5.	Electronically commutated motors: Brushless DC Drives :Introduction, Sinusoidal and Trapezoidal type, Electronic Commutator, control of Brushless DC Drives, Current Control, , Switching Circuits, Applications Switched reluctance motor drive: Construction, working, types, energy conversion Stepper motor drives.	10

Text Books:

1. Power electronics By M D Singh and K B Khanchandani by TMH publication 2nd edition.
2. “Power Electronics - circuits, devices and applications”, Prentice Hall of India, 2nd ed., 2000- Muhammad H. Rashid.

Reference Books:

1. Power Electronics – Devices, Converters and Applications”, by Vedam Subramanyam Revised 2nd edition, New Age Publications.
2. Power Electronics By P. S. Bimbhra, Khanna Publications.
3. Power Electronics, Converters, Applications and Design- Ned Mohan, Undeland and Robbins, Second Edition, John Wiley Publications.
4. Power Electronics- M. S. Jamil Asghar, PHI Learning Pvt. Ltd.
5. Power Electronics by V.R.Moorthi, Oxford University press.
6. Thyristorised controller by Dubey Joshi & Doralda, New age Publication.
7. Power Electronics & Variable Frequency drive, B.K.Bose IEEE press
8. Modern Power Electronics ”, S. Chand and Co. Ltd., New Delhi, 2000- P.C.Sen