

Teaching Scheme		Examination Scheme				
Theory Hrs.	Practical Hrs.	Theory Hrs.	Theory Marks	Pract./ Viva Marks	Term Work Marks	Total Marks
4	2	3	100	25	25	150

**SYLLABUS**

- Introduction to Power Electronics, Power Diodes, Power Transistors:** Overview of Power Electronics, Power Semiconductor Devices, Control Characteristics of Power Devices, Characteristics and Specification of Switches, Types of Power Electronic Circuits, Reverse Recovery Characteristics, Types of Power Diodes, Diodes with RC, RL, LC and RLC Loads, Free wheeling Diodes, Performance Parameters of Rectifiers, Power BJTs, Power MOSFETs, COOLMOSs, SITs, IGBTs, MOSFET Gate and BJT Base Drive Circuits, Isolation of Base and Gate Drive Circuits
- Thyristors:** Thyristor Characteristics, Two Transistor model of Thyristor, Thyristor Turn-On, Thyristor Turn-Off, Types of Thyristors, Series & Parallel Connections of Thyristors, Gate drive circuits.
- Controlled Rectifiers:** Principal of Phase Controlled Converter, Single Phase Semi Converter, Single Phase Full Converter, Single Phase Dual Converter, Three Phase Half wave Converters, Three Phase Semi Converter, Three Phase Full Converter, Three Phase Dual Converter. (Without analysis for RL load)
- Inverters:** Principal of Operation of Pulse Width Modulated Inverters, Performance Parameters, Single Phase Bridge Inverters, Three Phase Inverters, Current Source Inverter, Series Resonant Inverter, Parallel Resonant Inverter, Class E Resonant Inverter, Multilevel Inverter Concept, Applications & features of Multilevel Inverter.
- DC-DC Converters:** Principal of Step Down Converter, Principle of Step UP Converter, Performance Parameters, Converter Classification, Switch Mode Buck, Boost and Buck-Boost Regulators, Chopper Circuit Design.
- AC Controllers:** Principal of On Off Control, Principal of Phase Control, Cycloconverters, PWM Controlled AC Voltage Controllers.
- Protection of Devices and Circuits:** Cooling and Heat Sinks, Snubber Circuits, Reverse Recovery, Supply and Load Side Transients, Current & Voltage Protection, Electromagnetic Interference.
- Power Drives & Applications:** Characteristics of DC Motor, Operating Modes of DC Drives, Single Phase DC Drives, Breaking Schemes of DC-DC Converter Drives, Microcomputer Control of DC Drives, Control of AC Induction Motors using Voltage, Current and Frequency Control, Stepper Motor Control, Introduction to FACTS, Introduction to DC Power Supplies & Fly back Converter, UPS as AC Power Supply, Magnetic Design Considerations.

**REFERENCE BOOKS:**

1. Power Electronics Circuits, Devices and Applications by Muhammad H. Rashid, from PHI and Pearson Education. Third Edition.
2. Power Electronics by M D Singh and K B Khanchandani, TMH Publication
3. Power Electronics by M S Jamil Asghar, PHI Publication
4. Industrial & Power Electronics by Harish C. Rai (Umesh Publication)
5. Power Electronics by V.R.Moorthy (Oxford Press)
6. Power Electronics By P.C.Sen