

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Power Electronics

Semester: I

Subject Name: **Power Devices & Applications (Inter Disciplinary-I)**

Sr. No.	Course Content
1.	Introduction: Power Electronics System (PES) – Overview, Components & Building Blocks of PES, Concept of Power & Energy, Ideal and practical switch characteristics, losses in practical switches, Concept of Safe Operating Area (SOA), Semiconductor materials for Power devices, Power Converter classification.
2.	Power Devices: Power diodes, Power Transistors, Multilayer Devices, IGBT; its Construction, working, characteristics, ratings & protections circuits.
3.	Thyristor: Thyristor family components & its Construction, working, characteristics; turn-on methods, Gate Characteristics, Turn-off methods, ratings & protections of Thyristor.
4.	Firing & Commutation Circuits: UJT, PUT, CUJT, SUS & SBS, Firing circuits. Various commutating circuits.
5.	Applications: Solid state switching circuits, Light-dimmer control, Electronic timer, Alarm, Electronic crowbar, Battery charger, Power supply, Zero voltage switch.

Reference Books:

1. Power Electronics and its Applications by Alok Jain, 2nd edition, Penram International Pub(India) Pvt. Ltd.
2. Power Electronics Devices, Circuits and Industrial Applications, Oxford, V.R. Moorthi
3. Power Electronics Converters, Applications and design, Wiley, Mohan, Undeland, and Robbins.
4. Various Power Semiconductor Device manufacturer's Application note and data sheets.
5. Elements of Power Electronics, Philip T. Krein .Oxford Press.
6. Power Electronics, M. D. Singh & Khanchandani, TMH.