

# GUJARAT TECHNOLOGICAL UNIVERSITY

## M.E.in Power Electronics & Electrical Drives

### Semester: I

Subject Name: **Power Electronics - I**

Subject Code: **714501**

Sr. No	Course Content
1.	<b>REVIEW OF POWER SEMICONDUCTOR DEVICES</b> Review of Power semiconductor devices, Gate and Base drive circuits - Preliminary design considerations, Temperature control of power devices, Heat sink design, and Design of Magnetic components.
2.	<b>DC-DC CONVERTERS</b> Buck converter, Boost converter, Buck–Boost converters, CUK converter, Fly-back converter, Forward converter, Push–pull converter, Full bridge and Half bridge converters, Design considerations and comparison.
3.	<b>INVERTERS</b> Review of single phase bridge inverters, 3-phase bridge inverters, Pulse width modulated inverters, 1-pulse and multi pulse modulation, Sinusoidal PWM, Space Vector PWM, Reduction of harmonics Selective Harmonic Elimination Technique.
4.	<b>LINE COMMUTATED CONVERTERS</b> Principle of phase control, Review of single phase converters, 3 phase half and fully controlled converters, 12–pulse converter, Dual converters.
5.	<b>• AC VOLTAGE CONTROLLERS</b> Single phase AC voltage controllers, 3–phase AC voltage controllers.

### Reference Books:

1. Rashid, M. H., "Power Electronics Circuits, Devices, and Applications, Prentice-Hall of India Pvt. Ltd., New Delhi, 2nd edition, 1999.
2. Ned Mohan, Tore M. Undeland and William P. Robbins, "Power Electronics Converters, Applications, and Design", John Willey & Sons, Inc., 2nd Edition, 1995.
3. Agrawal, J. P., "Power electronic systems: Theory and design" Addison Wesley Longman (Singapore) Pte.Ltd. New Delhi, 2001.
4. Erickson Robert W., Maksimovic Dragan, "Fundamentals of Power Electronics", Kluwer Academic Publishers Group (Netherlands), 2001.