

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN POWER ELECTRONICS

SEMESTER: V

Subject Name: **Power Electronics Circuits**

Sr. No.	Course Content
1.	<p>AC to DC converters:</p> <ul style="list-style-type: none"> • Uncontrolled converters: Half wave uncontrolled converters, Half wave uncontrolled converters with a freewheeling diode, Half wave uncontrolled converters with RC load, Full wave uncontrolled converters • Controlled converters: Half wave fully controlled converters, Half wave half controlled converters, Full wave half controlled converters, Full wave full converters, Full converters with RLE load • Three phase converters: Three phase uncontrolled converters ,Three phase controlled converters • Multiple converters : Single phase parallel dual converters, Three phase dual converters • Reactive power of converters
2.	<p>AC to AC Converters:</p> <ul style="list-style-type: none"> • Ac voltage controller: On-off or integral cycle control, Principle of phase controlled switching, Full wave with R and RL load, Ac regulators with pure inductors, Three phase ac regulators, Electronic tap changers, Ac chopper regulators. • Cycloconverters: Single phase cycloconverters, Three phase to single phase cycloconverters, Three phase cycloconverters.
3.	<p>DC to DC Converters:</p> <ul style="list-style-type: none"> • Choppers: Principle, Classification, Forced commutated thyristor based choppers, Voltage commutation and resonant pulse commutated chopper, Load commutated chopper. • DC to DC converters without isolation: Buck or forward converter, Boost converter, Buck-boost converter, Cuk converter. • DC to DC converters with isolation: Fly back converters, Forward converter, Push pull converters, Full bridge converter.
4.	<p>DC to AC Converters:</p> <ul style="list-style-type: none"> • Inverters: Classification, Current source inverters, Voltage source inverters • Classification of Thyristor based inverters • Single phase half bridge voltage source inverters with R, RL and RC load • Single phase full bridge inverters • PWM inverters • Principle of operation of three phase inverters : 180° and 120° conductor mode • Current source inverters • Forced commutated Thyristor based inverter: Modified McMurray inverters,

	McMurray-Bedford inverters <ul style="list-style-type: none"> • Voltage control of Inverters: Control of input DC voltage, External control of AC output voltage, Internal control of inverters
5.	Resonant converters: <ul style="list-style-type: none"> • Series resonant circuit, Parallel resonant circuit • Zero current switching resonant converter, Zero voltage switching resonant converter • Resonant dc link converter, Resonant ac link converter

Reference Books:

1. Power electronics, PHI, Jamil Asghar.
2. Power Electronics Devices, Circuits and Industrial Applications, Oxford, V.R. Moorthi.
3. Power Electronics Circuits, Devices and Applications, M.H. Rashid.
4. Power Electronics, M. D. Singh, Khanchandani.
5. Introduction to Power Electronics, PHI, V. Jagannathan.
6. Power Electronics Converters, Applications and design, Wiley, Mohan, Undeland, Robbins.