COURSE CODE: **1152EE113**	COURSE TITLE: **MODERN POWER CONVERTERS**	L	T	P	C
		3	**0**	**0**	**3**

COURSE CATEGORY:

Program Elective

PREAMBLE :

In this course student will get exposure to basic principle of operation, structure, characteristics of power converters.

PREREQUISITE COURSES:

Power Electronics & Drives

RELATED COURSES:

Solid state AC & DC drives, Advanced Semiconductor Devices

COURSE EDUCATIONAL OBJECTIVES :

The objectives of the course are to make the students,

- Explaining about the Single phase bridge rectifiers with RL, RLE loads & effect of source impedance
- Explaining about the three phase bridge rectifiers with RL, RLE loads & effect of source impedance
- Teaching about design and analysis of dc –dc converters
- Presentation on single-phase bi-directional controllers with R, L and R-L loads, 3-phase controllers.
- Explicate the single phase and three phase cycloconverters.

COURSE OUTCOMES :

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Understand the overview of different types loads with single phase thyristor controlled converter.	K2
CO2	To understand the operation, characteristics and performance parameters three phase thyristor controlled converter.	K2
CO3	Analyze the different types of dc-dc converters.	K2
CO4	Understand the single-phase bi-directional controllers with R, L and R-L loads & 3-phase controllers	K2
CO5	Understand the Principle of operation, single phase and three phase Cycloconverters	K2

CORRELATION OF COs AND POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	H									H	L
CO2		H						M	M			
CO3		H										
CO4					H	L	H				H	L
CO5		L			L			M	M		H	L

COURSE CONTENT:

UNIT I	**SINGLE PHASE AC TO DC CONVERTERS**	**9**
Single phase bridge rectifiers, half controlled and Fully controlled converters with RL, RLE loads, freewheeling diodes, Dual Converter, sequence control of converters-inverter operation, Input harmonics and output ripple, smoothing inductance-power factor, effect of source impedance and overlap ,reactive power and power balance in converter circuits.		
UNIT II	**THREE PHASE AC TO DC CONVERTERS**	**9**
Semi and Fully controlled converters with R, RL, RLE loads, freewheeling diodes, Dual Converter, sequence control of converters-inverter operation, Input harmonics and output ripple, smoothing inductance-power factor, effect of source impedance and overlap, 12 pulse converter.		
UNIT III	**DC TO DC CONVERTERS**	**9**
Principle of operation, choice of communication circuit elements, Step down and step up choppers, classification, Voltage and current commutated choppers, effect of source Inductance, Filter circuits, multiphase chopper, resonant converters.		
UNIT IV	**AC VOLTAGE CONTROLLERS**	**9**
Principle of phase control, single-phase bi-directional controllers with R, L and R-L loads, 3-phase controllers, different configurations, Analysis with pure R and L loads.		
UNIT V	**CYCLOCONVERTERS**	**9**
Principle of operation, single phase and three phase cyclo converters, Power circuits, gating signals-harmonics and analysis of power factor		
		TOTAL: 45 PERIODS

TEXT BOOKS:

1. Rashid M.H., “Power Electronics Circuits, Devices and Applications ", Prentice Hall India, Second Edition, New Delhi, 1995.
2. P.C Sen.," Modern Power Electronics ", Wheeler publishing Co, First Edition, New Delhi-1998.

REFERENCE BOOKS:

1. Mohan N., Undeland and Robbins, “Power Electronics-Converters ", Applications and Design ", John Wiley and sons, Inc., New York, 1995.