

18PEE25		DESIGN OF POWER CONVERTERS		L	T	P	C
		3	0	0	3		
Course Objectives:							
1.	To know about the design concepts and flow.						
2.	To implements the device and circuit concepts for applications						
Unit I	DESIGN OF UNCONTROLLED RECTIFIERS				9	+	0
Selection of Rectifier topology – Pulse number – Power output - Selection of Diode – Voltage and Current Ratings – Selection of DC Filter – Design and Selection of Inductor and Capacitor with practical considerations							
Unit II	DESIGN OF CONTROLLED RECTIFIERS				9	+	0
Selection of Rectifier topology - Pulse number – Power output – Reactive Power Requirements - Selection of SCR – Voltage and Current Ratings - Selection of DC Filter – Design and Selection of Inductor and Capacitor – Triggering Sequence and Sequence control for improved power factor operation.							
Unit III	DESIGN OF SWITCH MODE INVERTERS				9	+	0
Selection of inverter topology – Power output – Harmonics – Reactive Power Requirements - Selection of Power Devices – Voltage and Current Ratings - Selection of output Filter – Design and Selection of Inductor and Capacitor – Different control strategy for various requirements.							
Unit IV	DESIGN OF SWITCH MODE DC-DC CONVERTERS				9	+	0
Selection of converter topology – Power output – Performance parameters - Selection of Power Devices – Voltage and Current Ratings - Selection of Filter – Design and Selection of Inductor, Capacitor and ferrite transformers. Control strategies for various requirements.							
Unit V	DRIVERS, PROTECTION OF DEVICES AND CONVERTERS				9	+	0
Driver requirements – Design of Drivers - Snubber – Polarized and Non-Polarized – Voltage Clamp-Thermal Resistances – Modes of Power dissipation – Heat sinking Design – Current Protection – Introduction to EMI							
Total (L+T)= 45 Periods							
Course Outcomes:							
<i>Upon completion of this course, the students will be able to:</i>							
CO1	:	<i>Understand design concepts and flow</i>					
CO2	:	<i>Select the appropriate circuit topology for applications</i>					
CO3	:	<i>Select the appropriate power devices</i>					
CO4	:	<i>Select and design the appropriate circuit to meet the design metrics</i>					
CO5	:	<i>Select the circuit configuration for electrical protection and scheme for thermal protection and derive methodology for selection of appropriate circuit for applications.</i>					
Reference Books:							
1.	Muhammad H. Rashid - Power Electronics Devices, Circuits, and Applications 4 Edition, Pearson 2014.						
2.	Barry W. Williams - Principles and Elements of Power Electronics – Devices, Drivers, Applications and Passive Components, ISBN 978-0-9553384-0-3.						

PO CO	CO Statement	PO1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO1 1
CO1	<i>Understand design concepts and flow</i>	1	1	1	1	1		1	1	1	1	1
CO2	<i>Select the appropriate circuit topology for applications</i>	1	1	1	1	1		1	1	1	1	1
CO3	<i>Select the appropriate power devices</i>	1	1	1	1	1		1	1	1	1	1
CO4	<i>Select and design the appropriate circuit to meet the design metrics</i>	1	1	1	1	1		1	1	1	1	1
CO5	<i>Select the circuit configuration for electrical protection and scheme for thermal protection and derive methodology for selection of appropriate circuit for applications.</i>	1	1	1	1	1		1	1	1	1	1