C.U.SHAH UNIVERSITY

FACULTY OF: Technology & Engineering
DEPARTMENT OF: Instrumentation & Control Engineering
SEMESTER: VI
COURSE: B.Tech
SUBJECT CODE: 4TE06PEL1
SUBJECT NAME: POWER ELECTRONICS

Teaching & Evaluation Scheme

Subject Code	Subject Name	Teaching Hours/Week				Credits	Evaluation Scheme/Semester							
							Theory				Practical			
							Sessional Exam		University Exam		Internal		University	Total Marks
		Th	Tu	Pr	Total		Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE06PEL1	POWER ELCTRONICS	4	0	2	6	5	30	1.5	70	3	--	20	30	**150**

OBJECTIVES:

1. To introduce the students to the field of Power electronics.
2. To make the students aware regarding various power electronic devices and circuits.

PREREQUISITES:

1. Basics of electronics engineering.

COURSE OUTLINES:

Sr. No.	Course Contents	No Of Hours
1	**POWER SEMICONDUCTOR DEVICE:** Power diodes & Transistors. Thyristor family (SCR, TRIAC, DIAC) their general characteristics.Two transistors analogy & its derivations. Turn-on & Turn-off methods.Series-Parallel connection of SCR. Snubber circuit di/dt & dv/dt calculations., IGBT	10
2	**PHASE CONTROLLED RECTIFIERS:** Half wave and full wave converters. Working of bridge converter with resistance & inductive load. Use of free-wheeling diode. Dual converters.	09
3	**INVERTERS:** Line commutated inverter: Force commutated inverter. Series-Parallel inverter. 1-Φ inverter. UPS.	09
4	**CHOPPERS:** Principle of operation. Chopper classification. Chopper circuits, Step-up &Step - down chopper. Jones Chopper, Morgan chopper.	08

5	**CYCLO - CONVERTER**: Principle of operation. Gate control of SCR in cyclo-converter. Different cyclo-converter circuits.	08
6	**INDUSTRIAL APPLICATIONS:** Static circuit breakers. D.C. motor control. A.C. motor control. Temperature control.	08

Learning Outcomes:

1. The students would be able to design power electronic circuits for various applications.

BOOKS RECOMMENDED:

1. Power Electronics: Circuits, Devices and Applications by M. H. Rashid, Prentice Hall-India.
2. Power Electronics by M.D. Singh, Tata McGraw-Hill Education.
3. Introduction to Thyristors & their Application by R. Ramamoorthy, East West Books.
4. Thyristors Theory and Applications by Sugandhi & Sugandhi, Wiley Eastern Limited.
5. Power Electronics by P. C. Sen, Tata McGraw-Hill Education.