

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

AUTOMOBILE ENGINEERING

Subject Name: Power Electronics & Control Engineering

Subject Code: 150203

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Internal Assessment (I)
4	0	2	6	70	30	50

Sr. No.	Course content
1.	Review of Scr, Triac and Ujt Characteristics: Applications in simple AC circuits, Principles and operation of Thyristor and Ignitron along with their applications in industrial rectifiers.
2.	Performance Characteristics of Dc Motors and Three-Phase Induction Motors: Matching of speed-torque characteristics of motor and load, Speed control of DC shunt motors using SCRs, Variable speed AC motor drives, Effect of harmonics.
3.	Applications of Power Electronics in Welding: Timers and sequential welding control. Welding transformers and power supplies, Variable reactance method for current control, Methods to avoid transient currents, Ignitron contactors, Leading and trailing tube circuits, Energy storage welding systems.
4.	High Frequency Heating: Basic principles of induction and dielectric heating, Calculation of depth of heat penetration and power requirement applications.
5.	Introduction to Microprocessors: Memory organization and CPU structure, Machine instructions and simple example programs on Intel 8085-based system, Basic input and output mechanisms.
6.	Applications of Microprocessors: Digital and analog input and output, AD and DA converters, Stepper motor control, Use of thermocouples and strain gauges, Programmable logic controllers, Introduction to ladder diagrams.

Reference Books:

1. M. Ramamoorthy, An Introduction to Thyristors and Their Applications Affiliated East, West Press.
2. R. R. Benedict and Nathan Weiner, Industrial Electronic circuits and Applications, Prentice Hall of India
3. G.M.Chute and R.D. Chute, Electronics in Industry, McGraw Hill International.
4. Douglas Hall, Microprocessors and Digital Systems, McGraw Hill International.