



C.U.SHAH UNIVERSITY – WADHWANCITY

FACULTY OF: - Technology and Engineering (Diploma Engineering)

DEPARTMENT OF: -Electrical Engineering

SEMESTER: - I

CODE: - 2TE01BEE1

NAME – Basic Electrical Engineering (BEE)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme								
		Th	Tu	Pr	Total		Theory				Practical (Marks)				Total Marks
							Sessional Exam		University Exam		Internal		University		
							Marks	Hours	Marks	Hours	Pr	TW	Pr		
<u>2TE01BEE1</u>	Basic Electrical Engineering (BEE)	4	0	2	6	5	30	1.5	70	3	30	20	-----	150	

Objectives:-

- To Developed the Basic Knowledge of Principles & Concept of Electrical Parameters
- Solve Electrical Circuit Using Circuit Laws & Network Theorems
- Understanding of Working Principle, Construction & Application of Electrical Machine
- To Developed the Basic of Protective Equipments & Safety Norms

Prerequisites: - Basic Knowledge of Physics & Mathematics & Importance of Electricity

Course Outlines:-

Sr. No.	Course Contents	No Of Hours
1	Fundamental of electrical circuit:- Current, voltage, E.M.F., potential difference, Conductor, semiconductor, insulator, Resistance, unit of resistance, Laws of resistance, Factor affecting on resistance, Specific resistance, Conductance, Conductivity, Temperature Co-efficient of resistance, Ohm's law and affecting parameters, Three states of electrical Circuit(Open Circuit, Short Circuit, Close Circuit)	6
2	Electrostatic & Electromagnetic :- Capacitor, Electrical Field strength & electrical field density, Relative Permeability, Energy store in capacitor, Capacitor in series & parallel, Types of capacitor, Charging & Discharging of capacitor, Terminology, Laws of Electromagnetic induction, Self inductance, Mutual inductance & Co-efficient of coupling, Magnetic Hysteresis & eddy current, B-H curve	7
3	Work, Power & Energy:- Nature of unit, S.I. System of unit, Terminology, Joule's law of electrical heating, Thermal efficiency	5
4	D.C. Circuit Terminology, Energy source & conversion, KVL & KCL, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power transfer Theorem, Reciprocity Theorem, Star-Delta transformation or Vice Versa	7

5	A.C. Fundamental & Circuit:- Generation of Alternating current & voltage & its equation, Waveform & vector representation of Alternating quantity, Terminology, RMS value, Average value, A.C. through Resistor, A.C. through Inductor, A.C. through Capacitor, Power, Power factor, Impedance & Q factor, RL Series circuit, RC Series circuit, LC Series circuit, RLC series circuit, RLC parallel circuit, Series Resonance & Parallel Resonance	8
6	Poly Phase System:- Generation of poly phase voltage, Phase sequence, Numbering phase & Interconnection of three phase, Star connection, Delta connection, Measurement of electrical power in 3-phase circuit by one & three watt meter method, Balance & Unbalance 3-phase load circuit, Advantage of 3-phase system	6
7	Fundamental of Electrical Machine:- D.C. Generator, types & application, D.C. Motor, types & application, Needs of starter & its types, Transformer, Induction motor, Alternator, Single phase motor	8
8	Utilization & Protection of Electrical Power Utilization- Heating, Welding, Domestic use, Different types of wiring, Protection Industry, Circuit Breaker, Relay, Isolator, Earth Switch, Domestic-Fuse, MCB, ELCB, Electrical Safety & Earthing, Necessity, Types, Electrical accident & its effect	7

List of Experiments:-

- Identify & Draw Symbol Used in Electrical Engineering.
- To Verify Ohm's Law.
- Perform Kirchoff's Law.
- Perform Superposition Theorem.
- Perform Thevenin's Theorem.
- Perform Series & Parallel Connection of Resistor.
- Perform Series & Parallel Connection of Capacitor.
- To Measure Current, Voltage & Power in Single Phase Circuit.
- To Measure Power & Power Factor in RL Circuit.
- To Measure Power & Power Factor in RLC Circuit.
- Current, Voltage & Power Measurement in Star & Delta Poly Phase Circuit.
- To Study about Different Electrical Machine.
- To Study about Protective Device & Safety Rules For Electricity.

Learning Outcomes:-

- Application & Importance of Electrical Power.
- Definition & Identification of Various Electrical Parameters.
- Calculation of Different Electrical Parameters by Different Laws.
- Knowledge of Different Electrical Machine.
- Knowledge of Protective Equipments & Safety Norms.

Books Recommended:-

- Elements of Electrical Engineering, **J.B.Gupta**, S.K.Katariya & Sons
- A Text Book of Electrical Technology, **B.L.Theraja & A.K.Theraja**, S.Chand & Company Ltd.
- A Hand Book of Electrical Engineering, **S.L.Bhatiya**, Khanna Publication