



GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Diploma in Vocation (D.Voc), 2nd Semester

Branch: All branches

Subject Name: Basic Electricity

Subject Code: 1220102

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	P	OJT		Theory		Tutorial/ Practical		
			University exams (ESE)	Progressive Assessment (PA)	External Practical /viva Exam(ESE)	Internal evaluation Practical /viva Exam(PA)		
3	-	-	3	50	-	-	-	50

L- Lectures; P- Practical; OJT- On Job Training; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Program Objectives:

- Define atomic structure of matter
- Define electricity, current, EMF, resistance
- Explain electrical power and electrical energy

Course Content: Theory

UnitNo.	Content	Hours
1.	Current Electricity Definition of Resistance, Voltage, Current, Power, Energy and their units, Relation between electrical, mechanical and thermal units, Temperature variation of resistance, Difference between AC and DC voltage and current.	06
2.	D.C. Circuits Ohm's Law, Series – parallel resistance circuits, calculation of equivalent resistance, Kirchhoff's Laws and their applications.	06
3.	Electric Cells Primary cell, wet cell, dry cell, battery, Li-ion battery, series and parallel connections of cells, Secondary cells, Lead Acid Cell, Discharging and recharging of cells, preparation of electrolyte, care and maintenance of secondary cells.	06
4.	Lighting Effects of Current Lighting effect of electric current, filaments used in lamps, and Tubelight, LED, their working and applications.	06
5.	Capacitors Capacitor and its capacity, Concept of charging and Discharging of capacitors, Types of Capacitors and their use in circuits, Series and parallel connection of capacitors, Energy stored in a capacitor.	06
6	Electromagnetic Effects Permanent magnets and Electromagnets, their construction and use, Polarities of an electromagnet and rules for finding them. Faraday's Laws of Electromagnetic Induction, Dynamically induced e.m.f., its magnitude and induction, inductance and its unit. Mutually induced e.m.f., its magnitude and direction, Energy stored in an inductance. Force acting on a current carrying conductor in magnetic field, its magnitude and direction, Principles and construction of dynamo.	06
7	A.C Circuits Generation of A.C. voltage, its generation and wave shape. Cycle, frequency,	06



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Branch: Automobile Servicing/Software Development

Subject Name: Basic Electricity

Subject Code: 1220102

	peak value R.M.S. value, form factor, crest factor, Phase difference, power and power factor, A.C. Series Circuits with (i) resistance and inductance (ii) resistance and capacitance and (iii) resistance inductance and capacitance, Q factor of R.L.C. series circuits.	
	Total Hours:	42

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
5	20	15	5	5

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate and above Levels (Bloom's Taxonomy)

Reference Books:

1. Electrical Technology by B.L.Therja, S.Chand Publication
2. Electrical Estimating & costing by Surjitsingh, Dhanpat Rai & Co.
3. Mittle N., "Basic Electrical Engineering", Tata McGraw Hill Edition, New Delhi, 1990.
4. Nagsarkar T K and Sukhija M S, "Basics of Electrical Engineering", Oxford press 2005.
5. Mehta V K, "Principles of Electronics", S.Chand& Company Ltd, 1994.

Course Outcomes:

At the end of this course students will be able to:

- Ability to identify the electrical components explain the characteristics of electrical machines.
- Ability to identify electronics components and use of them to design circuits.