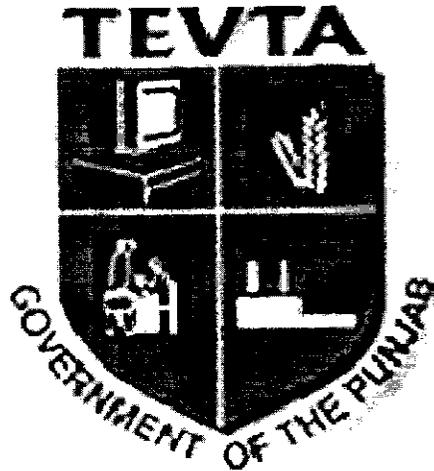


GOVERNMENT OF THE PUNJAB  
TECHNICAL EDUCATION & VOCATIONAL  
TRAINING AUTHORITY



CURRICULUM FOR

**ELECTRICIAN**

**(6 – Months Course)**

Revised April 2016

**APPROVED**

Date: 7-4-16

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**CURRICULUM SECTION  
ACADEMICS DEPARTMENT**

96-H, GULBERG-II, LAHORE

Ph # 042-99263055-9, 99263064

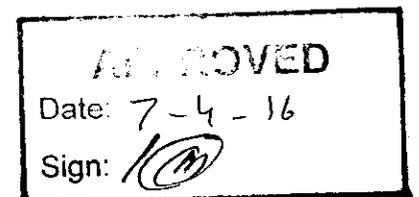
[gm.acad@tevta.gop.pk](mailto:gm.acad@tevta.gop.pk), [manager.cur@tevta.gop.pk](mailto:manager.cur@tevta.gop.pk)

**TRAINING OBJECTIVES:**

Industrial development is rapidly increasing with the qualitative products to meet the public needs. There, the trained & skillful persons play a vital role in the modern life because of technological development. This curriculum of six months duration is developed keeping in view the local job market demand and industrial requirements by more focusing on practical training along with necessarily required theoretical knowledge specially on common hand tools , wires handling , electrical wiring, industrial wiring, repair of house hold electrical appliances , their fault diagnoses & rectifications, measuring instruments and Lab. experiments in order to produce the skillful and capable workforce to meet the present & future demands of the job market along with Functional English and Information Technology knowledge.

**CURRICULUM SALIENTS:**

|                      |                   |
|----------------------|-------------------|
| Entry Level          | Middle            |
| Preferable           | Matriculation     |
| Duration of Course   | 6 - Months        |
| Total Training Hours | 800 Contact Hours |
| Training Methodology | Practical 80%     |
|                      | Theory 20%        |
| Instructional Media  | Urdu / English    |



**SKILL PROFICIENCY DETAILS:**

On successful completion of this course, the trainee should be able to: -

1. Work according to general workshop rules & regulation.
2. Use of common hand tools to carry out the bench work and measuring.
3. Use of common hand tools for Electrician.
4. Draw the circuit diagram according to the lay out and identifying their function.
5. Install all types of domestic and industrial wiring system including distribution board for single and three phase 4 wire's supply system.
6. Select and work on different types of protected devices (fuse, re-wire able and HRC. Types) and circuit breaker etc.
7. Connect and read volt, meter, AM meter wattmeter frequency meter KWH meter power factor meter and use of tong tester.
8. Install surface wiring, channel wiring and P.V.C pipe wiring in domestic type installation, concealed wiring and their earthing.
9. Install and operate single phase and 3 phase motor with drum switch / contactor and protection switches.
10. Repair house hold appliances i.e. electric iron, fans, electric heater, electric, kettle toaster washing machine sandwich maker etc.

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**KNOWLEDGE PROFICIENCY DETAILS:**

On successful completion of this course, the trainee should be able to: -

1. Explain the safety precautions, safety practice and firsthand offer treatment for electric shock.
2. Explain the electricity and its sources of generation.
3. Describe the current, volt, and resistance there units and relationship among them i.e. ohm's law and its simple application with the measuring resistance current and voltage drop in the resistor, use of ohm meter and magger.
4. Describe the series parallel and complex circuit of resistors.
5. Explain the voltage drop in the line, calculation if wire sixes and consultation of current tables.
6. Explain the estimation of material and tools for all domestic installation
7. Define the Magnetism, electro inductor and capacitor (construction of chock with its working principle, construction of capacitor and their capacity)
8. Define the construction of simple measuring instruments i.e. voltmeter, ammeter, watt and KWH meter and their working principle.
9. Explain the working principle of single motor (fans) capacitor and non-capacitor types cooker, electric iron simple & automatic and their construction & function
10. Describe the single phase and three-phase generation and its distribution.
11. Describe the single-phase motor used on machine and their faults rectification
12. Describe the construction of 3-phase motor and their faults rectification.
13. Define the single-phase transformer (construction working principle and its parts).

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**SCHEME OF STUDIES**

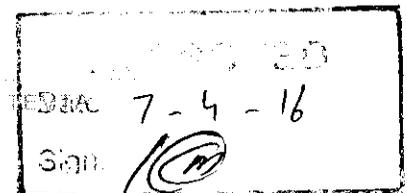
**Electrician**  
(6 – Months Course)

| S. No.       | Main Topics                     | Theory Hours | Practical Hours | Total Hours |
|--------------|---------------------------------|--------------|-----------------|-------------|
| 1.           | Workshop Practice-III           | 10           | 60              | 70          |
| 2.           | Measuring (Mechanical)          | -            | 20              | 20          |
| 3.           | Handling of Wires and Cable     | -            | 130             | 130         |
| 4.           | Electrical Measuring (Lab. Exp) | -            | 50              | 50          |
| 5.           | Trade Technology -I             | 40           | 0               | 40          |
| 6.           | Technical Mathematics           | 20           | 0               | 20          |
| 7.           | Technical Drawing               | 20           | 0               | 20          |
| 8.           | Domestic Wiring                 | 18           | 172             | 190         |
| 9.           | Industrial Wiring               | 18           | 72              | 90          |
| 10.          | Repair of House Hold Appliances | 10           | 40              | 50          |
| 11.          | I.T Fundamentals                | 8            | 32              | 40          |
| 12.          | Functional English              | 16           | 64              | 80          |
| <b>Total</b> |                                 | <b>160</b>   | <b>640</b>      | <b>800</b>  |

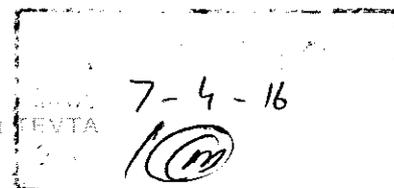
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**DETAIL OF COURSE CONTENTS**  
**Electrician**  
 (6 – Months Course)

| S. No. | Detail of Topics   | Theory Hours | Practical Hours |
|--------|--|--------------|-----------------|
| 1.     | <p><b>Workshop Practice</b></p> <p><b>1.1. Introduction (Workshop, Work Place, Tools)</b></p> <p>1.1.1. Order of workplace</p> <p>1.1.2. Introduction to general tools used in the metal workshop, their care and proper use</p> <p>1.1.3. Safety precautions</p> <p><b>1.2. Measuring (General Introduction)</b></p> <p>1.2.1. Purpose of measuring and checking tools</p> <p>1.2.2. Accuracy of measuring</p> <p>1.2.3. Linear measuring (steel rules, calipers, vernier calipers)</p> <p>1.2.4. Measuring Faults</p> <p>1.2.5. Care and Maintenance of Measuring tools</p> <p><b>1.3. Marking</b></p> <p>1.3.1. Necessity of marking</p> <p>1.3.2. Common marking tools (scriber, steel rule, &amp; centre punch)</p> <p><b>1.4. Filing</b></p> <p>1.4.1. Process of filing</p> <p>1.4.2. Types of files with regards to cut and shape</p> <p><b>1.5. Sawing</b></p> <p>1.5.1. Cutting principle (rake angle)</p> <p>1.5.2. The saw blade (pitch of teeth, setting of teeth and tightening the blade in the frame)</p> <p><b>1.6. Drilling</b></p> <p>1.6.1. Drilling of thought holes (effect of</p> | 10           | 60              |



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|  | <p>movements of the drill, cutting process)</p> <p>1.6.2. Main parts (their name and function)</p> <p>1.6.3. Clamping and removing of twist drills</p> <p>1.6.4. Drilling faults</p> <p><b>1.7. Reaming</b></p> <p>1.7.1. Purpose and process of reaming</p> <p>1.7.2. Types of reamers (Hand reamers, machine reamers and adjustable reamers)</p> <p><b>1.8. Counter Sinking and Counter boring</b></p> <p>1.8.1. Counter sinking tools, purpose and procedure</p> <p>1.8.2. Size / No. of Counter bore</p> <p><b>1.9. Filing Exercise – I</b></p> <p>1.9.1. Filing of Channel</p> <p><b>1.10. Marking Exercise</b></p> <p>1.10.1. Flat Filing</p> <p>1.10.2. Marking</p> <p>1.10.3. Centre Punching</p> <p><b>1.11. Filing Exercise – II</b></p> <p>1.11.1. Flat Filing</p> <p>1.11.2. Square Filing</p> <p><b>1.12. Sawing Exercise</b></p> <p>1.12.1. Sawing and Square Filing within size</p> <p><b>1.13. Sheet Metal Box – I</b></p> <p>1.13.1. Filing</p> <p>1.13.2. Marking</p> <p>1.13.3. Shearing</p> <p><b>1.14. Drilling Exercise</b></p> <p>1.14.1. Marking</p> <p>1.14.2. Center Punching</p> <p>1.14.3. Drilling</p> <p>1.14.4. De burring</p> |  |  |
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|-----------|--|---|----|
|           | 3.4.1 Marking and stripping the job<br>3.4.2 Splicing the strands of wire<br>3.4.3 Binding the job<br>3.4.4 Checking the joint<br>3.4.5 Soldering the joint<br>3.4.6 Wrapping the insulation tape<br><b>3.5 Making of 'Britannia' Joint</b><br>3.5.1 Making and stripping the job<br>3.5.2 Splicing the strands of wire<br>3.5.3 Binding the job<br>3.5.4 Checking the joint<br>3.5.5 Soldering the joint<br>3.5.6 Wrapping the insulation tape<br><b>3.6 Making of Spot Soldering</b><br>3.6.1 Cutting, cleaning<br>3.6.2 Assembling, soldering<br><b>3.7 Handling of Wire</b><br>3.7.1 Striping of wire<br>3.7.2 Marking of eyes<br>3.7.3 Bending of wire<br>3.7.4 Laying of wire<br><b>3.8 Handling of cable</b><br>3.8.1 Striping of cable<br>3.8.2 Bending of cable<br>3.8.3 Laying of cable<br>3.8.4 Making of connections<br>3.8.5 Connecting with supply and checking the function | - | 10 |
| <b>4.</b> | <b>Electrical Measuring (Lab Experiments)</b><br>4.1 Generation of E. M. F<br>4.2 Ohm's Law<br>4.3 Resistance of a wire  | - | 50 |

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|    | <p>4.4 Loss of voltage on lines</p> <p>4.5 Resistance and temperature</p> <p>4.6 Series Circuits</p> <p>4.7 Parallel Circuits</p> <p>4.8 Electrical Power</p>   |  |  |
| 5. | <p><b>Trade Technology</b></p> <p><b>5.1. Basic Electricity</b></p> <p>5.1.1. Definition</p> <p>5.1.2. Electricity a natural force</p> <p>5.1.3. Origin of electricity</p> <p>5.1.4. Importance of electricity</p> <p><b>5.2. Electric Charges</b></p> <p>5.2.1. Positive charge</p> <p>5.2.2. Negative charge</p> <p>5.2.3. Force between similar charges</p> <p>5.2.4. Fore between opposite charges</p> <p><b>5.3. Electricity has its origin in mater</b></p> <p>5.3.1. Conductors</p> <p>5.3.2. Insulator</p> <p>5.3.3. Composition of meters</p> <p>5.3.4. Atomic structure</p> <p>5.3.5. The free electrons as carriers of charge</p> <p><b>5.4. Electromotive force and electric current</b></p> <p>5.4.1. E.M.F.</p> <p>5.4.2. How to produce E.M.F.</p> <p>5.4.3. Types of current</p> <p>5.4.4. Direction of current</p> <p><b>5.5. Principles and theory of D.C.</b></p> <p>5.5.1. Electrical circuit and units</p> <p>5.5.1.1. The circuits</p> <p>5.5.1.2. Unit of current</p> <p>5.5.1.3. Unit of resistance</p> <p>5.5.1.4. Unit of voltage</p> | <p>3</p> <p>2</p> <p>3</p> <p>2</p> <p>2</p> |  |

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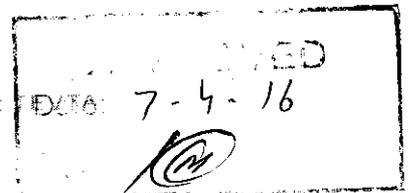

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|--------------|---|----|--|
|              | 5.5.1.5. Measurement of Current, Voltage and resistance                   |    |  |
| <b>5.6.</b>  | <b>Ohm's Law</b>  |    |  |
|              | 5.6.1. The Voltage ( $I \sim V$ )   | 2  |  |
|              | 5.6.2. The Resistance ( $I \sim VR$ )                                     |    |  |
|              | 5.6.3. Ohm's Law ( $I = V/R$ )  |    |  |
| <b>5.7.</b>  | <b>Resistance</b>   | 2  |  |
|              | 5.7.1. Definition   |    |  |
|              | 5.7.2. Specific Resistance  |    |  |
|              | 5.7.3. Conductivity   |    |  |
|              | 5.7.4. Materials used for resistors                                       |    |  |
| <b>5.8.</b>  | <b>Series Circuit</b>   | 2  |  |
|              | 5.8.1. Definition   |    |  |
|              | 5.8.2. Current in a series circuit  |    |  |
|              | 5.8.3. Series circuit as voltage divider                                  |    |  |
| <b>5.9.</b>  | <b>Parallel Circuit</b>   |    |  |
|              | 5.9.1. Definition   | 2  |  |
|              | 5.9.2. Voltage in a parallel circuit                                      |    |  |
|              | 5.9.3. Parallel circuit as current divider                                |    |  |
| <b>5.10.</b> | <b>Electric Power &amp; Energy</b>  |    |  |
|              | 5.10.1. Definition  | 10 |  |
|              | 5.10.2. Unit of Power & Energy ( $1\phi$ & $3\phi$ )                      |    |  |
|              | 5.10.3. Measuring of power & Energy ( $1\phi$ & $3\phi$ )                 |    |  |
| <b>5.11.</b> | <b>Protective Devices</b>   | 10 |  |
|              | 5.11.1. Definition of Fuse and its types (Re-wireable, HRC & Cartridge)   |    |  |
|              | 5.11.2. Definition of Circuit Breaker and its types (MCB & Earth leakage) |    |  |
|              | 5.11.3. Earthing and parts of earthing                                    |    |  |

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|-------------|--|---|--|
| <b>6.</b>   | <b>Technical Mathematics</b>                                 |   |  |
| <b>6.1</b>  | <b>Whole Numbers</b>   | 2 |  |
|             | 6.1.1 Addition and subtraction                               |   |  |
|             | 6.1.2 Multiplication and Division                            |   |  |
| <b>6.2</b>  | <b>Decimal Fractions</b>                                     | 1 |  |
|             | 6.2.1 Addition, Subtraction                                  |   |  |
|             | 6.2.2 Multiplication, Division                               |   |  |
| <b>6.3</b>  | <b>Conversion of Inch to Metric System</b>                   | 1 |  |
|             | 6.3.1 Conversion Inch to mm                                  |   |  |
|             | 6.3.2 Conversion of Dimensions                               |   |  |
| <b>6.4</b>  | <b>Percentages</b>   | 1 |  |
|             | 6.4.1 Definition   |   |  |
|             | 6.4.2 Changing numbers in to percent                         |   |  |
|             | 6.4.3 Changing percent to decimal and common fractions       |   |  |
| <b>6.5</b>  | <b>Fractions</b>   | 1 |  |
|             | 6.5.1 Addition, Subtraction                                  |   |  |
|             | 6.5.2 Proper fractions, improper fractions and mixed numbers |   |  |
|             | 6.5.3 Multiplication and Division of fractions               |   |  |
| <b>6.6</b>  | <b>Decimal System of Measurement</b>                         | 2 |  |
|             | 6.6.1 Meter, Gram, Liter                                     |   |  |
|             | 6.6.2 Multiples and parts of units                           |   |  |
| <b>6.7</b>  | <b>Transposition of Equations</b>                            | 1 |  |
|             | 6.7.1 Exchangeable sides of a scale                          |   |  |
|             | 6.7.2 Addition, Subtraction                                  |   |  |
| <b>6.8</b>  | <b>Transposition of Formula</b>                              | 1 |  |
|             | 6.8.1 Exercise with simple already known formula             |   |  |
|             | 6.8.2 Multiplication and division                            |   |  |
| <b>6.9</b>  | <b>Magnitudes of Current and Voltage</b>                     | 1 |  |
|             | 6.9.1 Units and subunits of Current, Resistance and Voltage  |   |  |
| <b>6.10</b> | <b>Ohm's Law</b>   | 2 |  |

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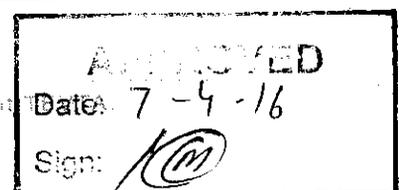
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|-----------|---|---|--|
|           | 6.10.1 Calculation of current, Voltage and Resistance |   |  |
|           | <b>6.11 Resistance of Wire</b>                        |   |  |
|           | 6.11.1 Resistance                                     | 2 |  |
|           | 6.11.2 Conductance                                    |   |  |
|           | <b>6.12 Series Circuit</b>                            |   |  |
|           | <b>6.13 Parallel Circuit</b>                          | 2 |  |
|           | <b>6.14 Electric Power &amp; Energy</b>               | 2 |  |
| <b>7.</b> | <b>Technical Drawing</b>                              |   |  |
|           | <b>7.1 Introduction to Technical Drawing</b>          | 2 |  |
|           | 7.1.1 Kinds of lines                                  |   |  |
|           | 7.1.2 Drawing instruments                             |   |  |
|           | 7.1.3 Lettering exercises                             |   |  |
|           | <b>7.2 Symbols of Electrical Circuits</b>             | 4 |  |
|           | 7.2.1 Voltage sources                                 |   |  |
|           | 7.2.2 Switches  |   |  |
|           | 7.2.3 Consumers                                       |   |  |
|           | <b>7.3 Simple Current Path Diagrams</b>               | 2 |  |
|           | <b>7.4 Single Pole Switch Circuit</b>                 | 2 |  |
|           | <b>7.5 Multi Pole Switch Circuit</b>                  | 2 |  |
|           | 7.5.1 Two-Way Switch Circuit                          |   |  |
|           | 7.5.2 Intermediate Switch Circuit                     |   |  |
|           | <b>7.6 Combination of Different Circuits</b>          | 4 |  |
|           | <b>7.7 Kitchen Installation</b>                       | 2 |  |
|           | <b>7.8 Living room Installation</b>                   | 2 |  |

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|----|--|---|----|
| 8. | <b>Domestic Wiring</b>                                   |   |    |
|    | <b>8.1. Two Different Circuits Installation</b>          | 4 | 20 |
|    | 8.1.1. Reading of Drawing                                | 2 |    |
|    | 8.1.2. Marking according to drawing                      |   |    |
|    | 8.1.3. Fixing of components                              | 2 |    |
|    | 8.1.4. Laying of wires in P.V.C pipe                     |   |    |
|    | 8.1.5. Stripping of wire and making electric connections |   |    |
|    | 8.1.6. Checking of function                              |   |    |
|    | <b>8.2. Kitchen Installation</b>                         |   | 20 |
|    | 8.2.1. Identification of two way switch                  | 2 |    |
|    | 8.2.2. Reading of drawing                                |   |    |
|    | 8.2.3. Marking according to drawing                      |   |    |
|    | 8.2.4. Fixing of components                              |   |    |
|    | 8.2.5. Laying of wires in P.V.C pipe                     |   |    |
|    | 8.2.6. Stripping of wire and making electric connections |   |    |
|    | <b>8.3. Drawing Room Installation</b>                    |   |    |
|    | 8.3.1. Reading of drawing                                |   |    |
|    | 8.3.2. Marking according to drawing                      | 2 | 25 |
|    | 8.3.3. Fixing of components                              |   |    |
|    | 8.3.4. Laying of wires in P.V.C pipe                     |   |    |
|    | 8.3.5. Stripping of wire and making electric connections |   |    |
|    | 8.3.6. Connecting with supply and checking the function. |   |    |
|    | <b>8.4. Sleeping Room Installation</b>                   |   |    |
|    | 8.4.1. Identification of intermediate switch             |   | 25 |
|    | 8.4.2. Reading of drawing                                |   |    |
|    | 8.4.3. Marking according to drawing                      | 2 |    |
|    | 8.4.4. Fixing of components                              |   |    |
|    | 8.4.5. Laying of wires in P.V.C pipe                     |   |    |
|    | 8.4.6. Stripping of wire and making electric             |   |    |



|             |   |  |    |
|-------------|---|--|----|
|             | connections   |  |    |
|             | 8.4.7. Connecting with supply and checking the function.  |  |    |
| <b>8.5.</b> | <b>Hall Installation</b>                                  |  | 25 |
|             | 8.5.1. Reading of drawing                                 |  |    |
|             | 8.5.2. Marking according to drawing                       |  |    |
|             | 8.5.3. Fixing of components                               |  |    |
|             | 8.5.4. Laying of wires in P.V.C pipe                      |  |    |
|             | 8.5.5. Stripping of wire and making electric connections  |  |    |
|             | 8.5.6. Connecting with supply and checking the function.  |  |    |
| <b>8.6.</b> | <b>Fluorescent Lamps with two Ballast</b>                 |  | 15 |
|             | 8.6.1. Identification of fluorescent tube                 |  |    |
|             | 8.6.2. Identification and use of choke                    |  |    |
|             | 8.6.3. Identification and use of holders                  |  |    |
|             | 8.6.4. Identification and use of starter.                 |  |    |
|             | 8.6.5. Reading of drawing                                 |  |    |
|             | 8.6.6. Marking according to drawing                       |  |    |
|             | 8.6.7. Fixing of components                               |  |    |
|             | 8.6.8. Laying of wires in P.V.C pipe / channel            |  |    |
|             | 8.6.9. Stripping of wire and making electric connections  |  |    |
|             | 8.6.10. Connecting with supply and checking the function. |  |    |
| <b>8.7.</b> | <b>Clock Switch Installation</b>                          |  | 20 |
|             | 8.7.1. Identification and use of clock switch             |  |    |
|             | 8.7.2. Reading of drawing                                 |  |    |
|             | 8.7.3. Marking according to drawing                       |  |    |
|             | 8.7.4. Fixing of components                               |  |    |
|             | 8.7.5. Laying of wires in P.V.C pipe                      |  |    |
|             | 8.7.6. Stripping of wire and making electric connections  |  |    |

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|   | <p>8.7.7. Connecting with supply and checking the function.</p> <p><b>8.8. Installation of Intercom Set</b></p> <p>8.8.1. Function of cradle switch</p> <p>8.8.2. Function of receiver and micro phone.</p> <p>8.8.3. Reading of drawing</p> <p>8.8.4. Marking according to drawing</p> <p>8.8.5. Fixing of components</p> <p>8.8.6. Laying of wires in P.V.C pipe</p> <p>8.8.7. Stripping of wire and making electric connections.</p> <p>8.8.8. Connecting with supply and checking the function.</p> <p><b>8.9. Installation of Test Board</b></p> <p>8.9.1. Reading of drawing</p> <p>8.9.2. Marking according to drawing</p> <p>8.9.3. Fixing of components</p> <p>8.9.4. Laying of wires</p> <p>8.9.5. Stripping of wire and making electric connections</p> <p>8.9.6. Connecting with supply and checking the function.</p> | 2 | 15 |
| 9 | <p><b>Industrial Wiring</b></p> <p><b>9.1. Making of Single Phase Motor Connection (ON-OFF by Drum Switch)</b></p> <p>9.1.1. Introduction of contact</p> <p>9.1.2. Identification of protection switch</p> <p>9.1.3. Identification using in motor</p> <p>9.1.4. Identification of drum switch</p> <p>9.1.5. Use of drum switch</p> <p>9.1.6. Fixing of components</p> <p>9.1.7. Laying of wire</p> <p>9.1.8. Making of connection</p>   | 5 | 20 |



|           |   |                            |                               |
|-----------|---|----------------------------|-------------------------------|
|           | <p>9.1.9. Checking the function</p> <p><b>9.2. Making of single phase motor connection reversing by drum switch</b></p> <p>9.2.1. Identification and use of single phase reversing drum switch</p> <p>9.2.2. Fixing of components</p> <p>9.2.3. Laying of wire</p> <p>9.2.4. Making of connection</p> <p>9.2.5. Connecting of supply and checking the function</p> <p><b>9.3. Making of 3 Phase Motor Connection (ON-OFF by Contactor)</b></p> <p>9.3.1. Identification and working</p> <p>9.3.2. Principle of magnetic contactor and uses.</p> <p>9.3.3. Identification and working principle of thermal over load relay</p> <p>9.3.4. Fixing of components</p> <p><b>9.4. Making of 3-Phase Connection Reversing by Contactor</b></p> <p>9.4.1. Identification and working</p> <p>9.4.2. Principle of magnetic contactor and uses</p> <p>9.4.3. Identification and working of thermal over load relay</p> <p>9.4.4. Fixing of component</p> <p>9.4.5. Understanding of control and power Circuit diagram</p> <p>9.4.6. Laying of wires and connection</p> <p>9.4.7. Testing and operating the motor</p> | <p>5</p> <p>5</p> <p>5</p> | <p>20</p> <p>20</p> <p>20</p> |
| <b>10</b> | <p><b>Repair Of Household Appliances</b></p> <p><b>10.1. Electric Iron</b></p> <p>10.1.1. Identification and using series lamp</p> <p>10.1.2. Checking open wire in 3-pin shoe.</p> <p>10.1.3. Checking and repairing of wire, loose</p>  | <p>1</p>                   | <p>5</p>                      |

|  |  |   |    |
|--|--|---|----|
|  | connection   |   |    |
|  | 10.1.4. Dis-mantling of iron and checking and testing heating element. |   |    |
|  | 10.1.5. Removing / Fixing heating element.                             | 4 |    |
|  | 10.1.6. Checking of thermostat.  |   |    |
|  | 10.1.7. Removing of fault.   |   |    |
|  | 10.1.8. Assembling of iron   |   |    |
|  | <b>10.2. Fan</b>   |   | 10 |
|  | 10.2.1. Checking and replacing burnt out cable.                        |   |    |
|  | 10.2.2. Identification and using of capacitor                          |   |    |
|  | 10.2.3. Checking of capacitor.   |   |    |
|  | 10.2.4. Checking of winding for open circuit                           |   |    |
|  | 10.2.5. Dis-mantling of fan.   |   |    |
|  | 10.2.6. Oiling and greasing of bushes and bearings                     | 1 |    |
|  | 10.2.7. Replacing of bearings / bushes.                                |   |    |
|  | 10.2.8. Assembling of fan  |   |    |
|  | 10.2.9. Checking and testing of fan.                                   |   |    |
|  | <b>10.3. Toaster &amp; Sandwich Maker</b>                              |   | 10 |
|  | 10.3.1. Identification and using of toaster / sandwich maker.          |   |    |
|  | 10.3.2. Checking the continuity for open circuit                       |   |    |
|  | 10.3.3. Replacing burnt out cable.                                     |   |    |
|  | 10.3.4. Dis-mantling checking and testing of heater elements           |   |    |
|  | 10.3.5. Removing / fixing electric heater elements.                    |   |    |
|  | 10.3.6. Checking of thermostat   |   |    |
|  | 10.3.7. Tracing of fault   |   |    |
|  | 10.3.8. Removing of Fault  | 1 |    |
|  | 10.3.9. Assembling of toaster / sandwich maker                         |   |    |
|  | 10.3.10. Checking and testing of toaster / sandwich maker.             |   |    |
|  | <b>10.4. Juicer Blender Machine</b>                                    |   |    |

|              |   |            |                    |
|--------------|---|------------|--------------------|
|              | <p>10.4.1. Identification and using of juicer blender machine.</p> <p>10.4.2. Checking the continuity of open circuit.</p> <p>10.4.3. Dismantling of juicer blender machine.</p> <p>10.4.4. Checking of control switches</p> <p>10.4.5. Checking and replacement of carbon brushes.</p> <p>10.4.6. Checking of commutator.</p> <p>10.4.7. Reassembling and checking of juicer blender machine.</p> <p><b>10.5. Washing Machine</b></p> <p>10.5.1. Identification and using of washing machine</p> <p>10.5.2. Checking the continuity for open circuit</p> <p>10.5.3. Checking and repairing of timer</p> <p>10.5.4. Checking and replacing of direction switch</p> <p>10.5.5. Checking and replacing of limit</p> | <p>1</p>   | <p>5</p> <p>10</p> |
| <b>Total</b> |   | <b>136</b> | <b>544</b>         |

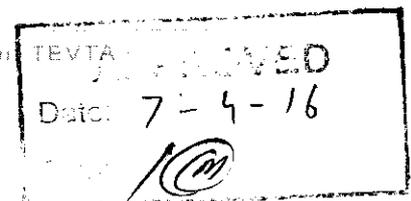
**APPROVED**

Date: 7-4-16

Sign: 

### LIST OF PRACTICALS

1. Identification and using, storing, care and maintenance common hand tools while keeping the workshop clean and observing the safety rules.
2. Measuring with steel rules, calipers, and Vernier calipers accurately.
3. Marking with scribe, steel rule, & center punch.
4. Filing exercise with regards to cut and shape.
5. Sawing following cutting principles.
6. Drilling and reaming exercises for through hole and desired depth.
7. Measuring with Vernier height gauge.
8. Preparation of terminal plate.
9. Making of wire married joint, soldering and wrapping insulation tape.
10. Making of T joint, soldering and wrapping insulation tape.
11. Making of cross joint, soldering and wrapping insulation tape.
12. Making of Britannia joint, soldering and wrapping insulation tape.
13. Making spot soldering.
14. Handling of wire.
15. Handling of Cable.
16. Installation of two different circuits.
17. Installation of kitchen circuit.
18. Installation of Drawing room circuit.
19. Installation of sleeping room circuit.
20. Installation of Hall circuit.
21. Installation of fluorescent lamps circuit with two ballast
22. Installation of Clock switch.
23. Installation of intercom set.
24. Installation of test board circuit.
25. Making of Single Phase motor On/Off connection by Drum switch.
26. Making of Single Phase motor reversing connection by Drum switch.
27. Making of 3 Phase Motor Connection ON / OFF by Contactor.
28. Making of 3 – Phase Connection Reversing by Contactor.
29. Testing and repair of Electric Iron.
30. Testing and repair of electric fan.
31. Testing and repair of Sandwich maker.
32. Testing and repair of Juicer Blender machine.
33. Testing and repair of washing machine



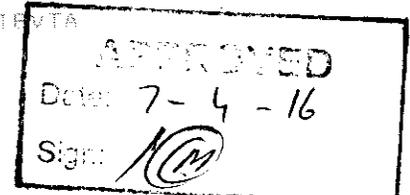
**SCHEME OF STUDIES****I.T. Fundamentals**

| <b>S.No</b>  | <b>Main Topics</b>         | <b>Theory Hours</b> | <b>Practical Hours</b> | <b>Total Hours</b> |
|--------------|----------------------------|---------------------|------------------------|--------------------|
| 1.           | Introduction to Computers  | 2                   | 6                      | 8                  |
| 2.           | Typing - Microsoft Word    | 4                   | 14                     | 18                 |
| 3.           | Internet & Electronic Mail | 2                   | 12                     | 14                 |
| <b>Total</b> |                            | <b>8</b>            | <b>32</b>              | <b>40</b>          |

APPROVED  
Date: 7-4-16  
Sign: 

**DETAIL OF COURSE CONTENTS**  
**I.T Fundamentals**

| S. No | Detail of Topics  | Theory Hours | Practical Hours |
|-------|---|--------------|-----------------|
| 1     | <p><b>Introduction to Computers</b></p> <p>1.1 What is a computer- Definition, functions and general features?</p> <p>1.2 What is Hardware –<br/>           1.2.1 Computer parts and units<br/>               1.2.1.1 Input Unit - Keyboard, Mouse etc.<br/>               1.2.1.2 Central Processing Unit<br/>               1.2.1.3 Output Unit</p> <p>1.3 What is Software –<br/>           1.3.1 Electronic Parts of a Pc it is<br/>               1.3.1.1 Software and Its types<br/>               1.3.1.2 System Software, Application software and its functions</p> <p>1.4 Working with windows Operating System<br/>           1.4.1 How does windows desktops work?<br/>           1.4.2 Setting desktop, background and wall papers etc.<br/>           1.4.3 Viewing directories – List of files and folders different styles.</p> <p>1.5 What are the Icons, Shortcuts and other graphic,<br/>           1.5.1 How to see computer contents on different drives etc.<br/>           1.5.2</p> | 2            | 6               |
| 2     | <p><b>Typing and Word processing (MS Word)</b></p> <p>2.1 Proper way of typing correct and speedy - getting familiar with the keys</p> <p>2.2 Where to type in computer? How to save a file? How to get it back? Where to find your saved work?</p> <p>2.3 Formatting in MS Word Bold, Italic, page setup, setting shades and colors.</p> <p>2.4 Working with saved work, opening and moving files.</p> <p>2.5 How to get it printed?</p>   | 4            | 14              |



|              |   |          |           |
|--------------|---|----------|-----------|
| 3            | <b>Emailing and Internet Surfing</b>  | 2        | 12        |
|              | 3.1 How to go to Internet, what is required for an internet connection etc. |          |           |
|              | 3.2 How to use email? How to search on web? Etc                             |          |           |
|              | 3.3 How to make new email account, login and logout an email account etc.?  |          |           |
|              | 3.4 Downloading and uploading attachments etc.                              |          |           |
| <b>Total</b> |   | <b>8</b> | <b>32</b> |

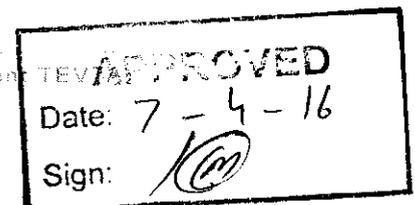
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**LIST OF PRACTICALS**  
I.T Fundamentals

| S. No. | Name of Practical                              |
|--------|--|
| 1.     | Turn On/Off and setting of power supply        |
| 2.     | Accessing The Desktop                          |
| 3.     | Using of Icons and Shortcuts                   |
| 4.     | Setting / customizing the desktop              |
| 5.     | Viewing the contents of computer – Directory   |
| 6.     | Setting the view of a folder                   |
| 7.     | Copying, Deleting and Moving Files in a folder |
| 8.     | Working with different Applications            |
| 9.     | Opening MS Word for typing                     |
| 10.    | First lesson of Typing A S D F                 |
| 11.    | Second Lesson of typing J K L ;                |
| 12.    | Third Lesson U I O P                           |
| 13.    | Fourth Lesson R E W Q                          |
| 14.    | Fifth Lesson N M , .                           |
| 15.    | Sixth Lesson V C X Z                           |
| 16.    | Seventh Lesson All letter using R index Finger |
| 17.    | Eighth Lesson All letter using L index Finger  |
| 18.    | Formatting in MS Word Bold, Italic etc.        |
| 19.    | Page Setting/ Page Layout                      |
| 20.    | Using Internet                                 |
| 21.    | Opening Email, making new account              |
| 22.    | Sending Receiving Emails                       |
| 23.    | Downloading and uploading attachments etc.     |

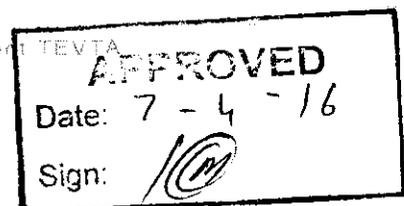
**SCHEME OF STUDIES**  
**Functional English**

| S.No         | Main Topics                                   | Theory Hours | Practical Hours | Total Hours |
|--------------|---|--------------|-----------------|-------------|
| 1.           | Use of past indefinite tense                  | 2            | 6               | 8           |
| 2.           | Use of 'was' 'were' ' questions and negatives | 3            | 6               | 8           |
| 3.           | Explaining a situations/ analysis             | 2            | 6               | 8           |
| 4.           | Communication in writing                      | 2            | 6               | 8           |
| 5.           | Comprehension                                 | 1            | 6               | 7           |
| 6.           | Application/ C.V.                             | 1            | 6               | 7           |
| 7.           | Dialogues                                     | 1            | 9               | 10          |
| 8.           | Understand vocabulary                         | 1            | 3               | 4           |
| 9.           | Writing complaints/ answers to complaints     | 1            | 9               | 10          |
| 10.          | Interviews                                    | 2            | 7               | 10          |
| <b>Total</b> |   | <b>16</b>    | <b>64</b>       | <b>80</b>   |



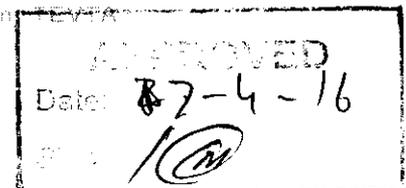
**DETAIL OF COURSE CONTENTS**  
Functional English

| S. No        | Detail of Topics   | Theory Hours | Practical Hours |
|--------------|--|--------------|-----------------|
| 1            | <b>Use of past indefinite tense</b><br>1.1 Describing past events  | 2            | 6               |
| 2            | <b>Use of 'was' 'were' ' questions and negatives</b>   | 2            | 6               |
| 3            | <b>Explaining a situations/ analysis</b><br>3.1 Making a plan<br>3.2 Visiting factory area<br>3.3 Giving justifications  | 2            | 6               |
| 4            | <b>Communication in writing</b><br>4.1 Asking for list of stationery items<br>4.2 Submitting report of performance of team of technicians<br>4.3 Submitting joining report | 2            | 6               |
| 5            | <b>Comprehension: practice sets</b>  | 2            | 6               |
| 6            | <b>Job application/C.V.</b>  | 1            | 6               |
| 7            | <b>Dialogues</b>   | 1            | 9               |
| 8            | <b>Understand vocabulary</b>   | 1            | 3               |
| 9            | <b>Writing complaints/ answers to complaints</b>   | 1            | 9               |
| 10           | <b>Interviews</b>  | 2            | 7               |
| <b>Total</b> |  | <b>16</b>    | <b>64</b>       |



**LIST OF PRACTICALS**  
**Functional English**

| S. No. | Practical        |
|--------|------------------|
| 1.     | Group discussion |
| 2.     | Interviews       |
| 3.     | Role play        |



**LIST OF LABS**

**Electrician**

- Electrical Lab / Workshop

**I.T Fundamentals**

- Computer Lab

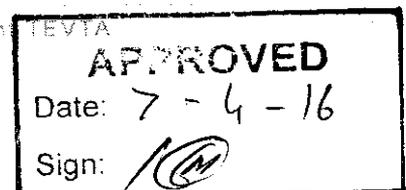
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**LIST OF TOOLS / EQUIPMENT ETC.**

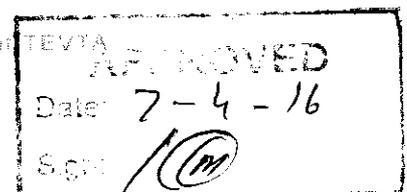
(For a Class of 25 Students)

|                      |                    |
|----------------------|--------------------|
| <b>Name of Trade</b> | <b>Electrician</b> |
| <b>Duration</b>      | <b>6-Months</b>    |

| <b>S. No.</b> | <b>Name of Tools / Equipment</b>            | <b>Quantity</b> |
|---------------|---|-----------------|
| 1.            | Screw Driver 4", 6", 8"                     | 25Nos each      |
| 2.            | Neon phase tester light duty pocket size    | 25 Nos          |
| 3.            | Insulated pliers with side cutter           | 25 Nos          |
| 4.            | Insulated long nose pliers with side cutter | 25 Nos          |
| 5.            | Insulated wire cutter                       | 25 Nos          |
| 6.            | High insulation rubber hand gloves          | 5 Nos           |
| 7.            | Knife                                       | 25 Nos          |
| 8.            | Chisels 6", 12"                             | 10 Nos each     |
| 9.            | Hammers 200 gm.                             | 25 Nos          |
| 10.           | Hack saws                                   | 25 Nos          |
| 11.           | Electric soldering iron 150 watt            | 10 Nos          |
| 12.           | Bridol                                      | 25 Nos          |
| 13.           | Philips screw driver No 1, 2, 3.            | 25 Nos each     |
| 14.           | Measuring tap 3m                            | 25 Nos          |
| 15.           | Steel foot rule.                            | 25 Nos          |
| 16.           | Files (Flat) 250 x 1, 200 x 2               | 25 Nos each     |
| 17.           | Files (Triangular) 150 x 2                  | 25 Nos          |
| 18.           | Files (Half round) 200 x 2                  | 25 Nos          |
| 19.           | Files (Round) 200 x 1                       | 25 Nos          |
| 20.           | Files (Raps cut) 150                        | 25 Nos          |
| 21.           | Bench Vice 5"                               | 25 Nos          |
| 22.           | Tri square 150 x 100 mm                     | 25 Nos          |
| 23.           | Vernier caliper 150 mm                      | 25 Nos          |
| 24.           | Center punch                                | 25 Nos          |
| 25.           | Hammer 500 grm                              | 10 Nos          |
| 26.           | Scriber                                     | 25 Nos          |



|     |  |        |
|-----|--|--------|
| 27. | Rubber hammer                                      | 10 Nos |
| 28. | Vice clamps  | 25 Nos |
| 29. | Insulation Remover 150 mm                          | 25 Nos |
| 30. | Bearing puller                                     | 2 Nos  |
| 31. | Farmer chisels 8"                                  | 10 Nos |
| 32. | Wooden saw 300 mm                                  | 10 Nos |
| 33. | Test boy   | 25 Nos |
| 34. | Volt meter (Panel type 4" x 4") 0-300V-AC 50 HZ    | 25 Nos |
| 35. | Ammeter (Panel type 4" x 4") 0-300V-AC 50 HZ       | 25 Nos |
| 36. | Multi-meter A.C / D.C (Digital)                    | 25 Nos |
| 37. | Tong tester  | 2 Nos  |
| 38. | Hand Electric drill machine with hammering 0-13 mm | 2 Nos  |
| 39. | Pedestal drill machine                             | 2 Nos  |
| 40. | Jigsaw machine portable                            | 1 No   |
| 41. | Scissor 6"   | 5 Nos  |
| 42. | Single phase energy meter 220V /10-20A             | 2 Nos  |
| 43. | Three phase energy meter 30 A                      | 2 Nos  |
| 44. | Single Phase Motor 220 Volts 50Hz ½ HP             | 2 Nos. |
| 45. | Three Phase Motor 380 Volts 50Hz 2 HP              | 2 Nos. |
| 46. | Electric Iron                                      | 2 Nos. |
| 47. | Ceiling Fan  | 2 Nos. |
| 48. | Electric Toaster                                   | 2 Nos. |
| 49. | Electric Sandwich maker                            | 2 Nos. |
| 50. | Juicer Blender Machine                             | 2 Nos. |
| 51. | Electric Washing Machine                           | 2 Nos. |



**COMPUTER LAB**

| S. No. | Tools / Equipment  | Quantity                                       |
|--------|--|--|
| 1.     | Desktop computer (Specifications as per notification issued by MIS Section, TEVTA) | 26<br>(1 for each student & 1 for the teacher) |
| 2.     | Printer (Laser)  | 01   |
| 3.     | Scanner  | 01   |
| 4.     | Internet Connection (At least 1 MB speed)  | 01   |
| 5.     | UPS 10 KVA   | 01   |
| 6.     | Air Conditioner 1 ½ Ton  | 02   |
| 7.     | Multimedia Projector   | 01   |

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**LIST OF CONSUMABLE**  
**(For a Class of 25 Students)**

**Electrician**

| S. No. | Nomenclature of Equipment / Tools               | Quantity       |
|--------|---|----------------|
| 1.     | Dust brush / File brush                         | 25 Nos each    |
| 2.     | Duster (cotton)                                 | 25 Nos each    |
| 3.     | Wire 3/0.029"                                   | 10 Coils       |
| 4.     | Wire 1/0.044"                                   | 5 Coils        |
| 5.     | Wire 7/0.029"                                   | 1 Coil         |
| 6.     | Cable 3 core 3/0.029"                           | 1 Coil         |
| 7.     | Cable 4 core 3/0.029"                           | 1 Coil         |
| 8.     | Switch Single pole                              | 5 Dozens       |
| 9.     | Switch two way                                  | 5 Dozens       |
| 10.    | Two Pin socket                                  | 3 Dozens       |
| 11.    | Three Pin socket                                | 3 Dozens       |
| 12.    | Lamp holder                                     | 10 Dozens      |
| 13.    | Incandescent Lamp (60/100/200 watt)             | Dozen each     |
| 14.    | Board Sheets 3"X3" ( 1 hole)                    | 12 Dozens      |
| 15.    | Board Sheets 7"X4" ( 4 hole)                    | 3 Dozens       |
| 16.    | Fuse kit Kat piano type 15 A                    | 3 Dozens       |
| 17.    | PVC Pipe ½"                                     | 1000 feet      |
| 18.    | PVC saddle ½"                                   | 25 Dozens      |
| 19.    | PVC Board 3"X3"                                 | 12 Dozens      |
| 20.    | PVC Board 7"X4"                                 | 3 Dozens       |
| 21.    | PVC Junction Box ½" (3 way & 4 way)             | 4 Dozen each   |
| 22.    | PVC Bend ½"                                     | 5 Dozens       |
| 23.    | Steel screw ½" & ¾"                             | 30 Packet each |
| 24.    | Connector Bar 10 & 16 Amp                       | 30 Bars each   |
| 25.    | Insulation Tape                                 | 3 Dozens       |
| 26.    | Florescent Tube with fitting (complete) 2'      | 25 No          |
| 27.    | Bell Push                                       | 3 Dozens       |
| 28.    | Bell / Buzzer                                   | 25 No          |
| 29.    | Magnetic Contactors 2 + 2 220 Volts / 10 A 50Hz | 50 Nos.        |
| 30.    | Push Button (Two / Three ) in single fitting    | 25 Nos. Each   |
| 31.    | Drum Switch single phase (On / Off, Rev / For)  | 10 Nos. Each   |

|     |  |                           |
|-----|--|---------------------------|
| 32. | Overload Relay 0.5 – 3.0 Amp   | 25 Nos.                   |
| 33. | Motor Protection Switch Three Phase  | 25 Nos.                   |
| 34. | Time relay 8 pin with base   | 25 Nos.                   |
| 35. | Clock switch   | 5 Nos                     |
| 36. | ELCB 63 Ampere (30mA)  | 5 Nos                     |
| 37. | Assorted Stationary items according to Lab/workshop infrastructure and training requirements | As demanded by Instructor |

**Functional English**

| S. No. | Item          | Quantity           |
|--------|---------------|--------------------|
| 1.     | Stationery    | As per requirement |
| 2.     | Board Markers | As per requirement |

**I.T Fundamentals**

| S. No. | Item           | Quantity           |
|--------|----------------|--------------------|
| 1.     | Printing Paper | As per requirement |
| 2.     | Printer Toner  | As per requirement |

**EMPLOYABILITY OF PASS-OUTS**

The pass-outs of this course can find job / employment opportunities in the following areas.

1. Industry (All Types)
2. Hospital
3. Railways
4. Construction Firm
5. Private Repairing Workshop
6. Technical Institution
7. Consultant's Firm

## REFERENCE BOOKS

### Electrician

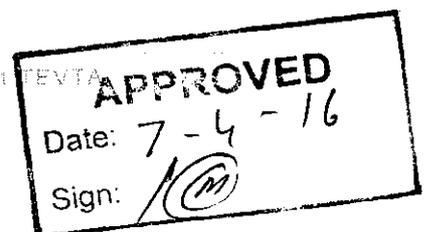
| S. No. | Title of the Book                          | Name of the Author                             | Name of the Publisher       |
|--------|--|--|-----------------------------|
| 1.     | Basic Electrical Engineering               | Aulgson Foltas Hiery<br>Rubtrash               | National Book<br>Foundation |
| 2.     | Electrical Engineering<br>Basic Technology | H-Hubscher<br>J.Klaus<br>W.Pfliger<br>S.Appelt | GTZ                         |
| 3.     | Electrical Technology                      | Edward Hughes                                  | Longman Group               |

### Functional English

1. High School English Grammar By Wren & Martin
2. Oxford English Grammar

### I.T Fundamentals

1. Introduction to Computer by Peter Norton
2. 2007 Microsoft® Office System Step by Step by Joyce Cox, Steve Lambert and Curtis Frye
3. Internet and E-mail with Windows 7 by Studio Visual Steps



**MINIMUM QUALIFICATION OF INSTRUCTOR**

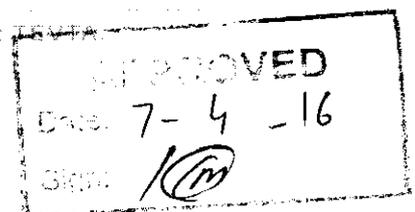
- B.Sc Engineering / B. Tech (Honors) / B. Tech. (Pass)  
OR
- Three years Diploma of Associate Engineering in Electrical Technology with two years experience in the relevant field.  
OR
- Two years Certificate of Electrician (G-II Level) with six years experience in the relevant field.

**Functional English**

- MA. (English)

**I.T Fundamentals**

- DAE CIT/ BCS from HEC recognized university



### List of Trade Related Jargon GENERAL VOCABULARY WORDS

|                    |                         |                     |                  |
|--------------------|-------------------------|---------------------|------------------|
| Bradawl            | سوا                     | Magnitude           | مقدار            |
| Capacitance        | ظرفیت                   | Making              | بنانا            |
| Checking           | جانچنا                  | Measurement         | پیمائش           |
| Components         | حصے                     | Multiplication      | ضرب              |
| Conductance        | ایصالیت                 | Parallel            | متوازی           |
| Conductivity       | کرنٹ گزارنے کی صلاحیت   | Percentage          | فی صد            |
| Conductor          | موصل                    | Plier               | پلاس             |
| Connecting         | جوڑنا                   | Power               | طاقت             |
| Consumer           | صارف                    | Principle           | اصول             |
| Current            | برقی رو                 | Protective Device   | حفاظتی آلہ       |
| Cutting            | کاٹنا                   | Removing            | ختم کرنا         |
| Decimal            | اعشاریہ                 | Resistance          | مزاحمت           |
| Diagram            | شکل                     | Resistivity         | مزاحمت کی صلاحیت |
| Energy             | توانائی                 | Reversing           | سمت تبدیل کرنا   |
| Equipment          | آلات                    | Scissor             | قینچی            |
| Faults             | نقص                     | Screw Driver        | پیچ کس           |
| Files              | ریتی                    | Semi-Conductor      | نیم موصل         |
| First Aid          | ابتدائی طبی امداد       | Series              | سلسلہ وار        |
| Fixing             | لگانا                   | Soldering           | ٹانکا لگانا      |
| Hacksaw            | لوہا کاٹنے والی آری     | Specific Resistance | مزاحمت مخصوصہ    |
| Hammer             | ھتوڑا                   | Structure           | ساخت             |
| Handling           | کنٹرول                  | Tools               | اوزار            |
| Identification     | شناخت                   | Tracing             | تلاش کرنا        |
| Installation       | لگانا                   | Tri square          | گنیا             |
| Insulation         | حاجز تہ                 | Understanding       | سمجھنا           |
| Insulation Remover | حاجز تہ اتارنے والا آلہ | Vernier Caliper     | ورنیئر کیلیپر    |
| Insulator          | حاجز                    | Voltage             | ووٹیج            |
| Magnet             | مقناطیس                 | Work                | کام              |

### SPECIFIC VOCABULARY WORDS

|                     |                |                       |                         |
|---------------------|----------------|-----------------------|-------------------------|
| Alternating Current | متغیر کرنٹ     | Electric Iron         | برقی استری              |
| Assembling          | جوڑنا          | House Hold Appliances | گھریلو آلات             |
| Ceiling Fan         | چھت والہ پنکھا | Laying                | بچھانا                  |
| Commutator          | کاموٹیٹر       | Sandwich Maker        | سینڈ وچ بنانے والی مشین |
| Direct Current      | یکساں کرنٹ     | Washing Machine       | کپڑے دھونے والی مشین    |

**Curriculum Revision Committee**

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