

SYLLABUS

ITI Electrician Course Syllabus

The ITI Electrician course is divided into 4 semesters. Below is the detailed syllabus for each semester:

1st YEAR Syllabus

Electrician Trade Theory (Professional Knowledge)

Unit 1: Occupational Safety & Health

- **Content:**
 - Safety rules and regulations
 - Electrical hazards and precautions
 - First aid practices
 - Fire safety

Unit 2: Earthing

- **Content:**
 - Types of earthing
 - Importance of earthing
 - Methods of earthing
 - Earthing procedures

Unit 3: Basic Electrical Concepts

- **Content:**
 - Electricity and its properties
 - Ohm's Law and applications
 - Conductors, insulators, and semiconductors
 - Resistors, solder, and flux
 - Electrolysis and its applications
 - Kirchoff's Law
 - Magnetism and magnetic fields
 - Cells and batteries
 - Alternating Current (AC)

Unit 4: Basic Electronics

- **Content:**
 - Introduction to basic electronic components
 - Diodes and their applications

Electrician Trade Practical (Professional Skills)

Unit 5: Practical Skills and Applications

- **Content:**
 - Health, safety, and environment practices
 - Verification of Ohm's Law
 - Soldering techniques
 - Measuring resistance
 - Installation of electrical accessories
 - Magnetic field tracing
 - Use of magnetic compass
 - AC circuits
 - Diodes and their applications
 - Earthing practices

Workshop

Unit 1: Mathematics and Physics Applications

- **Content:**
 - Square root calculations
 - Fractions, ratio, and proportion
 - Material science
 - Percentage calculations
 - Mass, weight, and density
 - Work, power, and energy
 - Speed and velocity

Engineering Drawing

Unit 1: Engineering Drawing Fundamentals

- **Content:**
 - Introduction and importance of engineering drawing
 - Line types and applications
 - Drawing instruments and their uses
 - Geometrical figure drawing
 - Dimensioning, lettering, and numbering
 - Free-hand drawing
 - Presentation methods of engineering drawings
 - Drawing sheet sizes and layouts
 - Symbolic representation

Employability Skills

Unit 1: Soft Skills and Literacy

- **Content:**
 - English literacy

- Communication skills
- I.T. literacy

Electrician Trade Theory (Professional Knowledge)

Unit 1: Advanced Electronics

- **Content:**
 - Oscilloscopes
 - Amplifiers
 - Transistors
 - Multivibrators

Unit 2: Electrical Wiring and Systems

- **Content:**
 - Electrical wirings
 - Digital electronics
 - Various wiring systems

Unit 3: Electrical Machines

- **Content:**
 - DC motors and generators
 - Transformers
 - Electrical measuring instruments

Electrician Trade Practical (Professional Skills)

Unit 1: Practical Skills and Applications

- **Content:**
 - Rectifiers, transistors, amplifiers, and oscilloscopes
 - DC generators and motors
 - DC machines and generators
 - Transformers

Workshop

Unit 1: Mathematics and Physics Applications

- **Content:**
 - Algebra
 - Trigonometry
 - Mensuration
 - Heat and temperature
 - Levers and simple machines
 - Basic electricity

Engineering Drawing

Unit 1: Drawing Techniques

- **Content:**
 - Construction of scales and diagonal scales
 - Geometrical drawing figures
 - Dimensioning practice
 - Free-hand sketching
 - Orthographic projection from isometric/3D views
 - Drawing solid figures
 - Projections

Employability Skills

Unit 1: Professional and Safety Skills

- **Content:**
 - Entrepreneurship skills
 - Occupational safety, health, and environment education
 - Productivity and quality tools
 - Labour welfare legislation

2nd Year Syllabus

Electrician Trade Theory (Professional Knowledge)

Unit 1: AC and DC Machines

- **Content:**
 - Universal motors
 - Three-phase induction motors
 - Single-phase induction motors
 - Alternators
 - Synchronous motors
 - Transformer winding
 - AC and DC machine winding

Unit 2: Industrial and Illumination Wiring

- **Content:**
 - Industrial wiring
 - Illumination systems

Electrician Trade Practical (Professional Skills)

Unit 1: Practical Skills and Applications

- **Content:**
 - Terminals of AC motors

- Terminals of alternators
- Induction motors
- Maintenance of alternators
- Motor generators
- Synchronous motors
- Electrical installations

Workshop

Unit 1: Mathematics and Physics Applications

- **Content:**

- Elasticity
- Magnetism
- Material properties
- Pressure
- Series and parallel connections
- Quadratic equations
- Indices
- AC waveform calculations

Engineering Drawing

Unit 1: Advanced Engineering Drawing

- **Content:**

- Alternating current diagrams
- Electric wiring and earthing
- Electronic components
- Transformers
- DC machines
- Illumination systems

Electrician Trade Theory (Professional Knowledge)

Unit 1: Control Systems and Power Generation

- **Content:**

- Machine control cabinets
- Domestic appliances
- Control elements
- Power generation (nuclear, hydroelectric)
- Transmission of electrical power
- Distribution of power
- Underground cables

Electrician Trade Practical (Professional Skills)

Unit 1: Practical Skills and Applications

- **Content:**

- Machine control cabinets
- Mounting control elements and wiring accessories
- Preparation of control cabinets and panels
- Transmission techniques
- Speed control of AC and DC motors
- Nuclear power plant simulator practice

Workshop

Unit 1: Advanced Mathematics and Physics

- **Content:**

- Friction
- Centre of gravity
- Forces
- Estimation and costing
- Number systems
- Advanced mensuration

Engineering Drawing

Unit 1: Specialized Engineering Drawing

- **Content:**

- Three-phase induction motors
- Winding diagrams
- Alternators
- Distribution of power
- Control panels

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