HIPOWER ENGINEERING,
18 JUNCTION,
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PRACTICAL ELECTRONICS TRAINING TOPICS

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1. Workshop Safety & Basic Electrical Theory

- Workshop rules and safety procedures
- ESD protection and PPE
- Electrical hazards and first aid
- Electrical quantities (voltage, current, resistance, power)
- Ohm's Law
- Series circuits
- Parallel circuits
- Basic electrical calculations
- Identification of basic tools and components

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2. Electronic Components & Soldering

- Resistors (types, values, color codes)
- Capacitors (types and applications)
- Inductors
- Diodes
- LEDs
- Zener diodes
- Transistor basics (BJT)
- Integrated circuit (IC) identification
- Soldering techniques
- Desoldering techniques
- PCB rework and repairs
- Component testing using multimeter

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3. DC Power Supplies & Battery Systems

- AC versus DC
- Transformers
- Rectifier circuits
- Filter circuits
- Linear power supplies

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- Battery types (lead-acid, lithium basics)
- Battery voltage and capacity
- Battery charging principles
- Simple battery charger circuits

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4. Semiconductor Devices & Amplifiers

- Diode applications
- Transistor operation
- Transistor switching circuits
- Amplifier principles
- Types of amplifiers
- Biasing methods
- Signal amplification
- Audio amplifier circuits
- Basic signal testing

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5. Digital Electronics (Basics)

- Number systems (binary, decimal, hexadecimal)
- Logic gates
- Truth tables
- Combinational logic circuits
- Logic IC identification
- Logic IC testing
- Simple digital projects (alarms, counters)

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6. Electronic Measuring Instruments

- Digital multimeter (advanced use)
- Analog multimeter
- Oscilloscope basics
- Signal generators
- Frequency measurement
- Instrument calibration basics
- Instrument handling and care
- Fault finding using instruments

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7. Household Electronics Repair

- Radio circuits and repair
- Television basics (CRT, LCD, LED)
- TV power supply circuits
- DVD players
- Audio systems
- Speakers and speaker repair
- Common electronic faults and symptoms
- Component replacement techniques

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8. Power Electronics & Motor Control

- SCRs (thyristors)
- TRIACs
- MOSFETs
- Power control circuits
- Inverter basics
- UPS operation basics
- AC motors
- DC motors
- Motor control circuits
- Motor protection systems

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9. Installation & Wiring Practices

- Domestic electrical wiring
- Cable types and sizing
- Earthing and grounding systems
- Protection devices (MCB, fuse, RCCB)
- Electrical installation standards
- Socket and switch wiring
- Distribution board installation
- Continuity testing
- Insulation resistance testing

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10. Microcontrollers & Basic Embedded Systems

- Introduction to microcontrollers
- Arduino basics
- PIC microcontroller basics
- Digital inputs and outputs
- Analog inputs
- Basic programming concepts
- LED control circuits
- Sensor interfacing
- Simple automation projects

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11. Troubleshooting & Fault Diagnosis

- Systematic troubleshooting methods
- Signal tracing techniques
- Common electronic faults
- Component-level fault diagnosis
- Repair documentation
- Repair reporting

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12. Entrepreneurship & Final Project

- Workshop management
- Customer handling
- Pricing and quotations
- Small business setup
- Business registration basics
- Ethics and professionalism
- Final practical project
- Project documentation
- Project presentation and defense
