

Overview of Electrical Engineering Technology

Overview of Electrical Engineering Technology
(A concise, easy-to-read guide for students and professionals)

1. What Is Electrical Engineering Technology (EET)?

Aspect	Description
Definition	Application-focused discipline that bridges pure electrical engineering theory and practical implementation.
Goal	Design, develop, test, install, and maintain electrical/electronic systems and equipment.
Typical Employers	Manufacturing firms, power utilities, telecommunications companies, aerospace & defense, automotive, research labs, and consulting agencies.
Degree Levels	Associate of Science (A.S.), Bachelor of Science (B.S.) in Electrical Engineering Technology, and graduate certificates.

2. Core Subject Areas

Subject	Key Topics	Typical Lab/Project Activities
Circuit Analysis	Ohm's law, Kirchhoff's laws, AC/DC analysis, network theorems	Breadboard building, simulation with SPICE, oscilloscope measurements
Digital Systems	Boolean algebra, combinational & sequential logic, microcontrollers, FPGA basics	Designing logic gates, programming Arduino/PIC, implementing simple state machines
Power Systems	Generation, transmission, distribution, transformers, protective devices	Power factor correction, fault analysis, building a small-scale distribution model
Control Systems	Open/closed-loop control, PID tuning, sensors & actuators	Lab on motor speed control, PLC ladder logic programming
Electronics	Semiconductor devices, amplifiers, signal conditioning, PCB design	Soldering, designing and fabricating a PCB, testing with a function generator

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Subject	Key Topics	Typical Lab/Project Activities
Instrumentation & Measurement	Sensors, data acquisition, calibration, signal processing	Using multimeters, data loggers, LabVIEW/Matlab for signal analysis
Communication Systems	Analog/digital modulation, RF fundamentals, networking basics	Building a simple RF transmitter, configuring Ethernet or Wi-Fi modules
Renewable Energy & Smart Grid	Solar PV, wind turbines, energy storage, grid integration	Installing a PV array, modeling battery management, smart meter data analysis

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3. Typical Job Roles

Role	Primary Responsibilities	Required Skills
Electrical/Electronic Technologist	Assemble, test, troubleshoot hardware; create documentation	Soldering, schematics reading, test equipment proficiency
Field Service Engineer	Install, commission, maintain equipment on-site; provide customer support	Diagnostic reasoning, communication, safety compliance
Control & Automation Technician	Program PLCs/HMI, integrate sensors/actuators, perform system commissioning	PLC programming (Ladder, Structured Text), networking
Power Distribution Technician	Inspect/repair transformers, switchgear, protective relays	Knowledge of NEC/IEC standards, high-voltage safety
Test Engineer	Design test plans, execute verification, generate reports	Data acquisition, statistical analysis, scripting (Python, LabVIEW)
Product Development Engineer	Prototype new devices, perform design-for-manufacturing (DFM) reviews	CAD/EDA tools (Altium, Eagle), rapid prototyping, cost analysis

4. Tools & Software Most Frequently Used

Category	Examples
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Circuit Simulation

LTspice, Multisim, PSpice

PCB Design

Altium Designer, KiCad, Eagle

Programming & Firmware

C/C++, Python, Assembly, Arduino IDE, MPLAB X

Control & Automation

RSLogix, Siemens STEP