ELEC 103

● ● ● Advanced 60 hours 4 modules · 28 lessons

Instrumentation, SCADA, Diagnostics & Troubleshooting

From the 4–20 mA loop to the SCADA screen — then the predictive testing and root-cause methods that restore a failed plant fast.

60	4	28	4,000	140	12
HOURS OF TRAINING	MODULES	LESSONS	STUDY CARDS	SCENARIOS	3D SIMULATORS

COURSE OBJECTIVES

By the end of this course you will be able to:

1. Scale, power and troubleshoot 4–20 mA loops and connect common field transmitters safely.
2. Explain SCADA architecture, polling, telemetry paths and industrial network zones and conduits.
3. Read PLC logic for lead/lag/alternate control and understand the scan cycle.
4. Plan a preventive and predictive maintenance program: infrared thermography, insulation resistance and polarization index, power-quality tests.
5. Diagnose motor and starter faults with a meter using a logical, safe test sequence.
6. Apply root-cause analysis and management-of-change to repeat failures.
7. Prioritize and execute emergency restoration after flooding, lightning or power loss.

WHAT YOU WILL LEARN

Process measurement loops
Transmitter wiring, scaling, compliance voltage, grounding and calibration.

SCADA & telemetry
Polling cycles, radio/cellular/fiber links, RTUs, alarms and cybersecurity basics.

Predictive testing
Thermography, megger/PI testing, vibration and trending — and what the numbers mean.

Systematic troubleshooting
Voltage-drop testing, divide-and-conquer and the meter-point method.

Root-cause analysis
Why motors fail: unbalance, single-phasing, heat, moisture and harmonics.

Emergency restoration
Flood triage, drying, megger decisions and portable-generator hookups.

MAJOR TOPICS COVERED

Module 5	Industrial Instrumentation & Process Measurement Loops	7 lessons
Module 6	SCADA, Telemetry & Industrial Control Networks	7 lessons
Module 9	Preventive Maintenance, Diagnostics & Predictive Testing	7 lessons
Module 10	Troubleshooting, Root-Cause Analysis & Emergency Restoration	7 lessons

COURSE HIGHLIGHTS

- **60 hours** of structured, self-paced instruction with active-time tracking.
- **12 interactive 3D simulators** — rotate, explode and cut away real equipment, then change the controls and watch the numbers respond.
- **140 field scenarios** with background, decision points and worked answers.
- **4,000 study cards**, 28 printable checklists and hands-on calculators.
- **Module quizzes** and a completion certificate with a verification code.

WHO IT'S FOR

Electricians and technicians who calibrate, troubleshoot and maintain instrument loops, telemetry, PLCs and electrical equipment at treatment plants and remote stations.

BEFORE YOU START

ELEC 101 and ELEC 102 recommended.

WHERE TO NEXT

IC 101 — Measurement Fundamentals (to specialize in instrumentation) or MECH 101 (to cross-train).

Start learning Create a free account at tryetech.com, open **Electrical & Controls** and begin with Module 5.