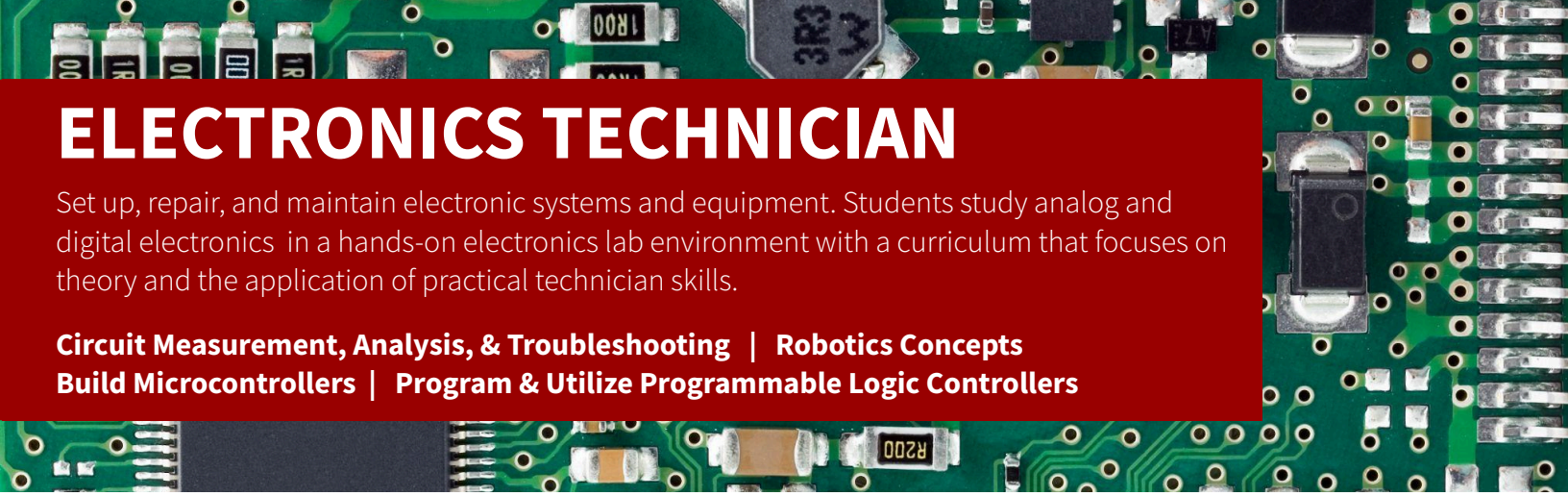

ELECTRONICS TECHNICIAN

Set up, repair, and maintain electronic systems and equipment. Students study analog and digital electronics in a hands-on electronics lab environment with a curriculum that focuses on theory and the application of practical technician skills.

Circuit Measurement, Analysis, & Troubleshooting | Robotics Concepts
Build Microcontrollers | Program & Utilize Programmable Logic Controllers

Suggested Abilities

- 11th grade English reading, writing, speaking, and listening
- Foundational understanding of algebra, geometry, & trigonometry
- Understanding of basic physics & chemistry
- Basic computer literacy
- Ability to work safely in a hands-on lab environment
- Willingness to engage in problem-solving, troubleshooting, and teamwork

Prerequisites

- *High School Students: Meet with counselor for eligibility requirements*

Class Hours

- Morning: 7:50am - 10:40am, Mon. - Fri.
- Afternoon: 12:05pm - 2:55pm, Mon. - Fri.

SEMESTER 1

ELT 1206 Fundamentals of DC/AC

4 credits

A foundational course covering the core laws and behaviors of DC and AC circuits, preparing for all later electronics work. Identify and analyze resistors, capacitors, inductors, and power supplies while building circuits on breadboards. Systematic troubleshooting with multimeters, oscilloscopes, power supplies, & function generators.

ELT 1002 Soldering

1 credit

High-reliability hand soldering, including wire and terminal soldering and PCB soldering of through-hole and surface-mount devices.

ELT 1234 Solid State Devices I

3 credits

Introduction to semiconductor devices and their real applications. Explore diodes: rectifiers, R-C/L-C filters, limiting and clamping circuits, zener regulation, LEDs, Schottky devices, and varactors. Emphasis includes analyzing datasheets, building circuits, and understanding how device characteristics influence circuit behavior.

ELT 1236 Introduction to Transistors

2 credits

Introduces the operation and applications of bipolar transistors, JFETs and MOSFETs. Includes switching circuits, single-stage small-signal amplifiers and troubleshooting.

ELT 1237 Advanced Transistors

3 credits

A deeper study of transistor-based analog circuits. Topics include voltage regulation, power amplification, Darlington pairs, emitter-followers, and multi-stage amplifier analysis. Focus on hands-on troubleshooting and real industry scenarios, including power supply sections found in consumer electronics.

ELT 2215 Operational Amplifiers

3 credits

Focuses on a study of integrated operational amplifiers and their applications. Troubleshooting is emphasized.

SEMESTER 2

ELT 1247 Digital Devices I

4 credits

Focuses on building and analyzing combinational logic circuits such as adders, encoders, decoders, multiplexers, and simple digital decision circuits. Students complete small real-world projects (LED displays, logic-based control circuits) and develop troubleshooting skills using multimeters and logic probes.

ELT 1248 Digital Devices II

3 credits

Focusing on sequential logic circuits. Students learn the operation and application of flip-flops, timers, counters, shift registers, and basic state-based circuits. Emphasis is on designing, building, and debugging real-world digital systems such as event counters, LED chasers, simple clocks, and automation-style logic.

ELT 2365 Microcontrollers

2 credits

An introduction to embedded systems using microcontrollers Arduino: digital and analog I/O, timing control, sensor interfacing, serial communication, and basic C-style programming. Emphasis on building small functional systems and developing both the hardware circuits and the software code that run them.

ELT 2358 Programmable Logic Controllers

3 credits

Covers industrial automation using Allen-Bradley PLCs. Students learn PLC hardware, I/O modules, wiring practices, ladder logic programming, timers, counters, and real-world applications.

ELT 2367 Introduction to Robotics

1 credit

Program a robot in a higher-level language to perform various tasks. Covers building and interfacing of sensor circuits using VEX robotics platforms. Covers robot structure, mechanical assembly.

ELT 2368 Robotics Technologies

3 credits

Industrial robotics and manufacturing automation overview covering axis configurations, work envelopes, programming, troubleshooting, maintenance, controls, sensors, motors, fluid power, and course previews.

ELT 2085 Independent Study

2 credits

A student-directed learning experience where individuals choose an advanced electronics topic or project with instructor approval as their graduation project. May include research, design, troubleshooting, system integration, or specialized skill development. Students document their work, complete milestones, and present final results.

Electronics Technician Certificate

1 Years

34 Credit Hours

Information Revised DEC '25. Information subject to change. Course listings have been paraphrased on this flyer, for full course info please see Pickens Catalog. This certificate is eligible for Financial Aid. If you have further questions, please call (303)344-4910.