

Electrical, Machine Tool, and Welding Technology

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From electrical contractors to welders and machine tool operators, Alfred State offers a variety of programs that prepare students to launch careers in high-demand professions. Each program provides 1,800 hours of related course work, theory, and hands-on practice, providing graduates with the necessary skills to be successful in these dynamic fields.

ELECTRICAL CONSTRUCTION & MAINTENANCE ELECTRICIAN PROGRAM

The hands-on electrical training provided in the first year consists of actual wiring projects off campus, as well as residential wiring projects in our laboratories. Our senior electrical students receive real-life experiences working with the campus maintenance department, trouble-shooting campus equipment, rewiring existing facilities, and designing and installing the electrical systems in the new facilities. Seniors will also design and install photovoltaic systems and wind turbine systems. They will work in the laboratories designing and installing automated projects (incorporating relay logic), PLCs, pneumatics, hydraulics, process control systems, three-phase transformer systems, industrial distribution, and motor theory and repair. All of the freshmen and senior students will utilize the National Electrical Code.

MISSION FOR ELECTRICAL CONSTRUCTION & MAINTENANCE ELECTRICIAN

Educate and instill in our students within a two-year time frame all of the information necessary to be successful in the electrical trades. This includes interpreting and understanding the National Electrical Code, electrical theory, mathematics, electrical nomenclature, wiring methods, and troubleshooting as it applies to residential, commercial, industrial wiring, and sustainable electrical systems. This also includes the necessity to work safely, be responsible, be dependable, and take pride in their craftsmanship.

TECHNICAL STANDARDS FOR THE ELECTRICAL CONSTRUCTION & MAINTENANCE ELECTRICIAN PROGRAM

It is essential that students in this degree program can participate fully and safely, with or without reasonable accommodations in all classrooms, laboratory, or field experiences required for completion of the program. Students in this degree program:

- Must be able to function in a safe manner, not placing themselves, faculty, staff, or other students in jeopardy.
- Must be able to appropriately and safely use standard laboratory equipment, materials, and instrumentation that requires possession of fine motor skills and mobility.
- Must be able to lift 50 pounds of materials up to 5ft to mount electrical panels at standard industry height.
- Must be able to communicate orally with a person 6 to 10 feet away.
- Must be able to read and decipher information found in technical manuals.
- Must be able to visually translate information on analog or digital meters and other test equipment.

MISSION FOR WELDING AND CNC MANUFACTURING & MACHINING TECHNICIANS

Strive to provide employers with entry-level technicians who are capable of functioning in and adapting to a rapidly changing environment.

TECHNICAL STANDARDS FOR WELDING & CNC MANUFACTURING & MACHINING PROGRAMS

It is essential that students in this degree program can participate fully and safely, with or without reasonable accommodations in all classrooms, laboratory, or field experiences required for completion of the program. Students in this degree program:

- Must be able to function in a safe manner, not placing themselves, faculty, staff, or other students in jeopardy.
- Must be able to appropriately and safely use standard laboratory equipment, materials, and instrumentation that requires possession of fine motor skills and mobility.
- Must be able to lift up to 50 pounds to a height of 5ft in order to load materials into manufacturing machines.
- Must be able to communicate orally with a person 6 to 10 feet away in a shop environment.
- Must be able to visually decipher an oscilloscope monitor and digital/ analog meter, and scan tool displays.
- Must be able to diagnose mechanical failures that are distinguished audibly.
- Must be able to understand and retain information found in service repair manuals and use diagnostic flow charts.
- Must be able to stand for long periods of time.

DEPARTMENT FACILITIES

- **Electrical Trades Labs** - Our electrical trades laboratories are well equipped with the latest in electrical test equipment. Students will facilitate learning by direct hands-on applications of the theory, knowledge, and skills presented in lecture. In this program, approximately 50 percent or more of each day is spent working hands on in the laboratory or at a job site. Computer technology has been integrated into all of the courses.
- **Machine Tool/Manufacturing Labs** - The first-year lab is equipped with lathes, mills, shapers, grinders, etc., and appropriate tools acquired from a \$1 million grant from the Gleason Foundation. In the second year of the CNC Manufacturing and Machining program, learning takes place in a state-of-the-art laboratory, where students are instructed in the use of multiple CNC machines that expand their experience to best prepare them for the manufacturing shop environment.
- **Sustainable Advanced Manufacturing Center** - This \$5 million, 16,000 square-foot facility houses freshman and senior welding students and senior CNC Manufacturing and Machining students, who train for in-demand jobs, while learning state-of-the-art sustainable practices in advanced manufacturing through more efficient processes. The building includes classrooms, a computer lab, a welding booth shop, a welding fabrication shop, material handling and preparation space, a CNC machine shop, and metrology and inspection space.

REQUIRED TOOLS/EQUIPMENT

A list of required tools, equipment, PPE, etc. for all of the programs mentioned above can be found at www.alfredstate.edu/tool-lists.

DEPARTMENT PROGRAMS

[Electrical Construction and Maintenance Electrician](#) (AOS)

[CNC Manufacturing and Machining](#) (AOS)

[Welding Technology](#) (AOS)