



## ADVANCED MANUFACTURING CAREER CLUSTER: PROGRAMS OF STUDY AT-A-GLANCE

Tennessee's Advanced Manufacturing programs of study equip students with relevant, portable skills in fields that have been identified as rapidly growing and strategically important to the economy. Recent revisions to the Advanced Manufacturing cluster have yielded four robust pathways, designed with flexibility to help communities across Tennessee prepare students for the wide range of high-skill and high-demand jobs available in manufacturing-related fields. All four programs of study contain the core knowledge and skills vital for success in advanced manufacturing careers, including safety, tools and equipment, interpreting and reading blueprints, operations, materials, layout and measurement, quality assurance, and process evaluation. In addition, each program of study culminates with a practicum course which allows students to apply the skills learned in previous courses in the context of a simulated or authentic work environment.

### WELDING

#### COURSE SEQUENCE:

1	Principles of Manufacturing
2	Welding I
3	Welding II
4	Manufacturing Practicum

**DESCRIPTION:** Welding is designed to prepare students for entry-level welder certification. Skills in basic shielded metal, gas metal, flux cored, and gas tungsten arc welding are developed over a series of three courses.

**OUTCOMES:** Upon completion of this POS, proficient students will be able to apply quality control methods to the welding process, as well as be eligible to complete the American Welding Society (AWS) Entry Welder qualification and certification.

### ELECTROMECHANICAL TECHNOLOGY

#### COURSE SEQUENCE:

1	Principles of Manufacturing
2	Introduction to Electromechanical
3	Advanced Electromechanical
4	Manufacturing Practicum

**DESCRIPTION:** Electromechanical Technology is designed for students who wish to pursue careers related to industrial maintenance. The course content focuses on analytical understanding, troubleshooting, operation, and maintenance of electrical, instrumentation, and mechanical systems in typical manufacturing facilities.

**OUTCOMES:** Upon completion of this POS, proficient students will be prepared to pursue postsecondary electromechanical programs and entry-level industrial maintenance technology careers.

### MECHATRONICS

#### COURSE SEQUENCE:

1	Principles of Manufacturing
2	Digital Electronics
3	Mechatronics I
4	Mechatronics II and/or Manufacturing Practicum

**DESCRIPTION:** Mechatronics program content focuses on the components and design of manufacturing systems, electronics, mechanics, fluid power systems, and computer control systems, as well as the collection and analysis of quality data, technical documentation, and troubleshooting.

**OUTCOMES:** Upon completion of this POS, proficient students will be prepared to pursue industry certification and coursework at a technology or community college, or an engineering degree at a four-year postsecondary institution.

### MACHINING TECHNOLOGY

#### COURSE SEQUENCE:

1	Principles of Manufacturing
2	Principles of Machining I
3	Principles of Machining II
4	Manufacturing Practicum

**DESCRIPTION:** Machining Technology is designed to prepare students for careers such as machinist, computer-numerical-control (CNC) operator, and machine setter. It focuses on concepts and practices needed to be successful in a production environment supported by advanced machining and engineering facilities.

**OUTCOMES:** Upon completion of this POS, proficient students will have gained experience to pursue postsecondary education and certifications related to the metalworking industry.