



A DUAL ENROLLMENT CAREER PATHWAY FOR

MECHATRONICS TECHNOLOGY TECHNICAL OPERATORS I

TCTC Anderson Campus or Pendleton Campus

tctc.edu/careerpathways

About the Program

- Students studying this major learn how to operate, test, maintain, or adjust unmanned, automated, mechanical, or electromechanical equipment. Some technicians may assist engineers in designing or testing robotic equipment.
- Students have the opportunity to earn up to 2 college certificates, depending on when they enter the pathway, and apply all college credits/certificates toward the associate degree.
- Created with employer input, Tri-County's Mechatronics Technology program produces graduates in high demand for great paying jobs in companies that are using the latest technologies for competing in the global marketplace.
- Students build a competitive and marketable resume for a variety of employment opportunities, primarily in advanced manufacturing, including aerospace, automotive, medical, and plastics.

About the Pathway

- Mechatronics Technology is a Technical Career Pathway in which courses and textbooks are at no cost to students planning to enter the career field after high school.
- High school students take dual enrollment classes at the **TCTC Anderson** or **Pendleton campus**.
- After high school, students seamlessly transition into the Associate in Applied Science degree Mechatronics Technology program at Tri-County Technical College.

Mechatronics Technology CAREER PATHWAY

IN HIGH SCHOOL

Prior to TCTC Dual Enrollment Courses, students may receive TAP credit for MEC 110, with successful completion of high school courses and the validation process.

FALL
• MEC 101
• MEC 110

SPRING
• MEC 102
• MEC 103

Technical Operators I Certificate

**HIGH SCHOOL GRADUATION +
TECHNICAL OPERATORS I
CERTIFICATE**

**AND
12 HOURS COLLEGE CREDIT**

AFTER HIGH SCHOOL

**Mechatronics Technology
Associate in Applied Science Degree**

SUMMER
• MEC 111 • MEC 120 • IDS 114 • MAT 170

FALL
• MEC 112 • MEC 113 • MEC 130

SPRING
• MEC 150 • MEC 200 • MEC 210 • ENG 165

SUMMER
• MEC 201 • MEC 211 • Social Science Requirement • Humanities Requirement

FALL
• MEC 212 • MEC 213 • MEC 214 • General Education Requirement

SC Mean Annual Wages
\$60,550-\$98,939

AFTER TCTC GRADUATION

Students may go directly to work or continue their education in

**ADVANCED MANUFACTURING
TECHNOLOGY**

**BACHELOR OF APPLIED SCIENCE
DEGREE**

USC Upstate

CONNECT WITH US

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MECHATRONICS TECHNOLOGY COURSE DESCRIPTIONS

The Mechatronics program assists students in acquiring the multifunction skills needed in today's manufacturing environment.

MEC 101 - Circuit Analysis

Class Hours: 3 Lab Hours: 0 Credit Hours: 3

This course is a study of applying mathematics to properly analyze and solve series, parallel, and series-parallel circuits. In addition, this course also explores the fundamentals of reading circuit diagrams and prints.

Corequisite: MEC 110.

MEC 102 - Industrial Machining and Tools

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course covers the fundamentals of machining metals by the operations of milling, drilling, and tapping along with the principles of precision measurements. In addition, safety guidelines of operating metalworking machines and hand tools that are commonly used in an industrial maintenance environment will be covered.

MEC 103 - Hydraulics and Pneumatics

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course covers the introduction to fluid power systems and the principles of how hydraulics and pneumatics are utilized in manufacturing. In addition, the study of fluid power symbols and schematics are related to the actual working component installations.

MEC 110 - DC Circuits

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course is a study of direct current theory. Series, parallel, and series-parallel circuits are solved using Ohm's law and critical thinking skills. In addition to solving, circuits are constructed and tested for proper operation using various measuring instruments.

Corequisite: MEC 101.

IDS 114 - Employability Skills

Class Hours: 3 Credit Hours: 3

Students will practice employability skills through simulated workplace scenarios in order to apply and interview for, and secure employment. Students will create professional application documents, perform mock interviews, and apply soft skills to a variety of workplace scenarios.

MAT 170 - Algebra, Geometry and Trigonometry I

Class Hours: 3 Lab Hours: 0 Credit Hours: 3

This course includes the following topics: elementary algebra, geometry, trigonometry and applications.

Prerequisites: Satisfactory math placement scores, or MAT 032 with a grade of "C*" or higher.

Note: This course cannot be used for an AA or AS degree.

MEC 111 - AC Circuits

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course is a study of the fundamentals of alternating current theory. Circuits are constructed using various resistive, inductive, and capacitive components, and then tested for proper operation using various measuring instruments. In addition, three phase power and transformers are covered and analyzed.

Prerequisites: MEC 101 and MEC 110.

MEC 120 - Sensors and Instrumentation

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course is a study of basic industrial instruments with particular emphasis on the devices utilized to control modern manufacturing processes. Emphasis is placed on various types of sensors and how they interface with computers and controllers with machines to accomplish a task.

MEC 112 - Digital Controls

Class Hours: 3 Lab Hours: 3 Credit Hours: 4

This course is a study of logic, mathematics, components, and circuits utilized in digital control systems. Emphasis is placed on logic used in hardwired and programmable systems.

Prerequisites: MEC 101.

MEC 113 - Solid State Devices

Class Hours: 3 Lab Hours: 3 Credit Hours: 4

Course Description This course is a study of the principles of solid state devices such as diodes, transistors, and FET's. In addition to exploring the theory behind semiconductor materials, circuits are constructed, analyzed, and tested for proper operation.

Prerequisites: MEC 101, MEC 110, and MEC 111.

MEC 130 - Motor Controls

Class Hours: 3 Lab Hours: 3 Credit Hours: 4

This course is an introduction to the principles and applications of motor control circuits. A study of the various control devices and wiring used in industrial processes is also covered.

Prerequisites: MEC 101, MEC 110, MEC 111.

ENG 165 - Professional Communication

Class Hours: 3 Lab Hours: 0 Credit Hours: 3

This course develops practical written and oral communication skills.

Prerequisites: Satisfactory placement scores in both Reading and Writing.

Note: 1. This course cannot be used for an AA or AS degree.
2. Course is not offered online.

MEC 150 - Mechanical Systems

Class Hours: 2 Lab Hours: 3 Credit Hours: 5

This course covers mechanical transmission devices, including various methods of how torque, HP, and motion are generated. In addition, the correct procedures for installation, removal, and maintenance as related to manufacturing equipment will be covered.

Prerequisites: MEC 102.

MEC 200 - AC/DC Machines

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course is a study of applications, operations, and construction of AC and DC machines. Generators, AC/DC motors, and alternators are wired and tested for proper functionality.

Prerequisites: MEC 101, MEC 110, and MEC 111.

MEC 210 - Programmable Logic Controllers I

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course is an introduction to programmable logic controllers with an emphasis on basic programming techniques. Basic hardware as well as a variety of input/output devices and their applications are covered. Programs are constructed, operated, and tested.

Prerequisites: MEC 101, MEC 110, MEC 111, MEC 112, and MEC 130.

MEC 201 - AC/DC Drives

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course covers the principles of operation and application of AC drives and DC drives, and additional motor control devices and techniques.

Prerequisites: MEC 101, MEC 110, MEC 111, and MEC 130.

MEC 211 - Programmable Logic Controllers II

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course covers the application of programmable logic controller theories and operation procedures. Topics such as interfacing data manipulation and report generation are covered. Programmable controller projects are constructed, operated, and tested.

Prerequisites: MEC 101, MEC 110, MEC 111, MEC 112, MEC 130, and MEC 210.

MEC 212 - Robotics and Automation

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course includes programming and testing robotic equipment used in automation with a concentration on connecting, assembling, and automating manufacturing processes.

Prerequisites: MEC 101, MEC 110, MEC 111, MEC 112, MEC 130, and MEC 210.

MEC 213 - Technical Troubleshooting

Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course consists of a systematic approach to troubleshooting techniques used to diagnose failures in mechanical, electrical, and fluid power systems. In addition, utilizing the proper testing equipment that aids in locating the root cause of machine malfunctions.

Prerequisites: MEC 101, MEC 110, MEC 111, MEC 112, MEC 130, MEC 210, and MEC 211.

MEC 214 - Reliability Centered Maintenance

Class Hours: 3 Credit Hours: 3

This course is the study of methods of preventive and predictive maintenance that ensures continuous improvement. This includes vibration analysis, infrared photography, and ultrasonic measuring equipment.



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