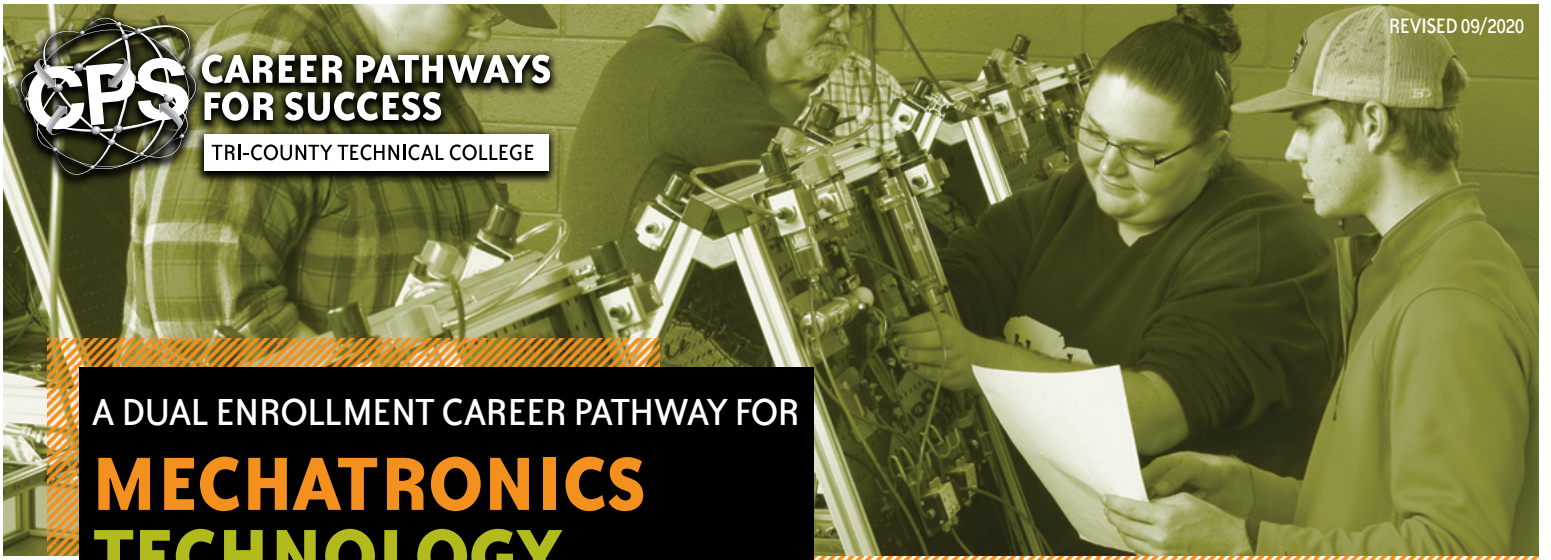




# CAREER PATHWAYS FOR SUCCESS

TRI-COUNTY TECHNICAL COLLEGE



## A DUAL ENROLLMENT CAREER PATHWAY FOR **MECHATRONICS TECHNOLOGY**

### 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.

#### CONNECT WITH US

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[tctc.edu/careerpathways](http://tctc.edu/careerpathways)

## Mechatronics Technology CAREER PATHWAY

### IN HIGH SCHOOL

Prior to TCTC Dual Enrollment Courses, students may receive TAP credit for up to 3 of the following courses: EEM 117, EEM 118, EEM 173, EEM 230, IMT 131, IMT 141, IMT 161, with successful completion of high school courses and the validation process.

#### FALL

- EEM 117
- EEM 217

#### SPRING

- EEM 161
- IMT 131

Technical Operators I  
Certificate

**High School Graduation +  
Technical Operators I  
Certificate  
and  
16 Hours College Credit**

### AFTER HIGH SCHOOL

#### Mechatronics Technology Associate in Applied Science Degree

#### SUMMER

- IMT 112
- IMT 224
- IMT 230

#### FALL

- IMT 161
- IMT 233
- IMT 141
- ENG 165
- MAT 170

#### SPRING

- EEM 118
- IDS 106
- QAT 101
- AMT 105
- IMT 202

#### SUMMER

- Social Science Requirement
- Humanities Requirement
- General Education Course

### AFTER TCTC GRADUATION

Students may go directly to work or continue their education in

#### Advanced Manufacturing Technology

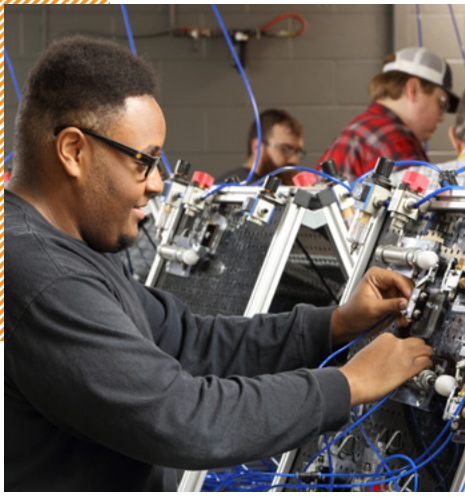
#### Bachelor of Applied Science Degree

Greenville Technical College

Or

USC Upstate

SC Mean Annual Wages  
**\$59,790**



# MECHATRONICS TECHNOLOGY

## COURSE DESCRIPTIONS

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

### AMT 105 - ROBOTICS AND AUTOMATED CONTROL I

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

This course includes assembling, testing, and repairing equipment used in automation. Concentration is on connecting, testing, and evaluating automated controls and systems.

Prerequisites: IMT 131, IMT 141 and IMT 233.

### EEM 117 - AC/DC CIRCUITS I

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

This course is a study of direct and alternating theory, Ohm's Law, series, parallel, and combination circuits. Circuits are constructed and tested.

### EEM 118 - AC/DC CIRCUITS II

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

This course is a continuation of the study of direct and alternating current theory to include circuit analysis using mathematics and verified with electrical measurements.

Prerequisites: EEM 117.

### EEM 131 - SOLID-STATE DEVICES

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

This course is a study of semiconductor theory and common solid-state devices. Circuits are constructed and tested.

Prerequisites: EEM 118 or equivalent

### EEM 161 - INDUSTRIAL INSTRUMENTS

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

This course is a study of basic industrial instruments with particular emphasis on the devices utilized to control modern manufacturing processes.

### EEM 173 - ELECTRICAL INSTALLATION I

Class Hours: 1 Lab Hours: 3 Credit Hours: 2

This course is an introduction to the study of electrical wiring techniques commonly used in commercial, industrial and residential applications. Emphasis will be placed on compliance with the National Electrical Code.

### EEM 217 - AC/DC MACHINES WITH ELECTRICAL CODES

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

This course is a study of AC and DC machines to include operational theory, applications, and construction. Relevant sections of the National Electrical Code will also be covered.

### EEM 221 - DC/AC DRIVES

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

This course is a study of logic, mathematics, components and circuits utilized in digital equipment.

Prerequisites: IMT 141.

### EEM 230 - DIGITAL ELECTRONICS

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

This course is a study of logic, mathematics, components and circuits utilized in digital equipment.

### EEM 251 - PROGRAMMABLE CONTROLLERS

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

This course is an introduction to programmable control systems with emphasis on basic programming techniques. A variety of input/output devices and their applications are covered.

Prerequisites: EEM 230 or IMT 141.

### EEM 252 - PROGRAMMABLE CONTROLLERS APPLICATIONS

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

This course covers the application of programmable 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: EEM 251.

### EEM 275-TECHNICAL TROUBLESHOOTING

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

This course consists of a systematic approach to troubleshooting. Techniques used to analyze proper circuit operation and malfunctions are studied.

Prerequisites: EEM 251.

### ELT 251-SPECIAL TOPICS IN ELECTRONICS

Class Hours: 2 Lab Hours: 0 Credit Hours: 2

This course covers a special phase or area of electronics.

Prerequisites: EEM 118.

### ENG 165 - PROFESSIONAL COMMUNICATION

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

This course develops practical written and oral communication skills.

Prerequisites: Satisfactory ACCUPLACER placement scores in both Reading and Writing.

### HSS 105 - TECHNOLOGY AND CULTURE

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

This course provides a study of the impact of technological change on cultural values, society, and the individual.

### IDS 106 -EMPLOYMENT DEVELOPMENT SKILLS

Class Hours: 4 Lab Hours: 0 Credit Hours: 4

This course offers the student a simulated work experience in a lab setting. Students will perform mock interviews and learn soft skills required for the job market.

### IMT 112 - HAND TOOL OPERATIONS

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

This course covers the use of hand tools and their applications in industrial and service areas.

### IMT 131 - HYDRAULICS AND PNEUMATICS

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

This course covers the basic technology and principles of hydraulics and pneumatics.

### IMT 141 - ELECTRICAL CONTROL DEVICES

Class Hours: 3 Lab Hours: 6 Credit Hours: 5

This course covers principals and applications of electrical motor, control circuits, and industrial equipment.

Prerequisites: EEM 117 with a grade of C or better.

### IMT 161 - MECHANICAL POWER OPERATIONS

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

This course covers mechanical transmission devices, including the procedures for installation, removal, and maintenance.

### IMT 202 - ELECTRICAL TROUBLESHOOTING

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

This course covers diagnosing a mechanical problem using prints and electrical troubleshooting techniques.

Prerequisite: IMT 131, IMT 161, and IMT 233.

### IMT 224 - BASIC ELECTRONICS THEORY

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

This course is the study of basic electronic theory. Students will learn to identify electronic system components and interpret electronic schematic diagrams.

Prerequisites: EEM 118.

### IMT 230 - RELIABILITY CENTERED MAINTENANCE

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

This course is the study of methods of predictive and preventive maintenance. Vibration analysis, infrared photography and ultrasonics will be covered.

### IMT 233 - PROGRAMMABLE LOGIC CONTROLLERS

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

This is the study of programmable logic controllers. Students will learn how to state the characteristics of different types of memory and count and convert between number systems.

Prerequisites: IMT 141.

### 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 better.

### PSY 120 - ORGANIZATIONAL PSYCHOLOGY

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

This course is a study of basic psychological principles of supervision and organizational dynamics. Emphasis is placed on people skills and general human relation techniques in the workplace. This course will not satisfy any Associate of Arts or Associate of Science requirements.

### QAT 101 - INTRODUCTION TO QUALITY ASSURANCE

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

This course covers the fundamentals of quality control, the evolution of the total quality system and the modern philosophy of quality. Process variability, fundamentals of probability, and the basic concepts of control charts are included.