A DUAL ENROLLMENT CAREER PATHWAY FOR

ENGINEERING SYSTEMS TECHNOLOGY

tctc.edu/careerpathways

About the Program

- Students studying this major learn how to assist engineers, typically in an industrial setting, in creating systems that integrate workers, machines, materials, information, and energy to make a product or provide a service. Students who enjoy solving problems and want to work with sophisticated robots should consider Engineering Systems Technology.
- Students have the opportunity to earn up to 19 hours of college credit, depending on comparable courses taken in high school, and apply all college credits toward the associate degree.
- Created with employer input, Tri-County's Engineering Systems 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

- Engineering Systems 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 Pendleton campus alongside other college students.
- After high school, students seamlessly transition into the Associate in Applied Science degree Engineering Systems Technology program at **Tri-County Technical College**.

Engineering Systems Technology CAREER PATHWAY

IN HIGH SCHOOL

Prior to 12th grade Engineering Systems Technology classes, students may receive TAP credit for up to 3 of the following: EGT 152, EGR 175, EET 145,EGR 130, with successful completion of the validation process.

11th* or12th Grade:

(Courses offered in afternoon)

FALL
- EET 113
- EGR 130

SPRING
- EET 145
- EET 274

HIGH SCHOOL GRADUATION + UP TO 19 HOURS OF COLLEGE CREDIT

AFTER HIGH SCHOOL

Engineering Systems Technology Associate in Applied Science Degree

FALL
- ENG 165
- EET 131
- EGR 175
- MAT 170
- MET 224

SPRING
- MAT 171
- EET 212
- EGR 184
- PHY 101
- EET 235

SUMMER
- AMT 102
- AMT 103
- MET 238

FALL
- HSS 105
- PSY 120
- EGR 275
- EGR 194

SC Mean Annual Wages
$56,037-$61,217

AFTER TCTC GRADUATION

Students may go directly to work or continue their education in

ENGINEERING TECHNOLOGY MANAGEMENT

BACHELOR OF APPLIED SCIENCE DEGREE

USC Upstate

CONNECT WITH US

hsde@tctc.edu | 864-646-1505

REVISED 06/2022 WAGE INFORMATION OBTAINED THROUGH EMSI FROM O*NET ONLINE BY THE U.S. DEPARTMENT OF LABOR, EMPLOYMENT AND TRAINING ADMINISTRATION (USDOL/ETA). RETRIEVED OCTOBER, 2022.

ENGINEERING SYSTEMS TECHNOLOGY COURSE DESCRIPTIONS

Engineering Systems Technology teaches students how computers communicate with machines. Students learn how to program and troubleshoot computers, robots, and automated equipment.

AMT 102 - Computer-Controlled Machinery
Class Hours: 3 Lab Hours: 3 Credit Hours: 4

This course covers the fundamentals of robot geometry, controls mechanisms, sensors, programming, installation, safety and maintenance, and other computer-controlled systems.

AMT 103 - Sensors
Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course covers the theory of operation of various processes and discrete sensors used in modern industrial plants plus the techniques of interfacing these sensors with controllers (i.e., robot, work cell, programmable and process controls).

EET 113 - Electrical Circuits I
Class Hours: 3 Lab Hours: 3 Credit Hours: 4

This course is a study of direct and alternating currents, covering resistance and impedance in series, parallel, and series-parallel circuits using Ohm's Law, Kirchhoff's Laws, and basic circuit theorems. Circuits are analyzed using mathematics and verified using electrical instruments.

EET 131 - Active Devices
Class Hours: 3 Lab Hours: 3 Credit Hours: 4

This course is a study of semiconductor theory and principles, diodes and diode circuits, transistors, transistor circuits, and other components. Circuits are modeled, constructed, and tested.

Prerequisites: EET 113 .

EET 145 - Digital Circuits
Class Hours: 3 Lab Hours: 3 Credit Hours: 4

This course is a study of number systems, basic logic gates, Boolean algebra, logic optimization, flip-flops, counters and registers. Circuits are modeled, constructed, and tested.

EET 212 - Industrial Robotics
Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course is the study of the systems design, modeling and simulation, signals and control systems, AI, sensor integration, vision systems, robot programming, and principles of mechatronics.

EET 235 - Programmable Controllers
Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course is a study of relay logic, ladder diagrams, theory of operation, and applications. Loading ladder diagrams, debugging, and troubleshooting techniques are applied to programmable controllers.

Prerequisites: Permission of Department Head, Program Director, or Coordinator of Instructional Activities.

EET 274 - Selected Topics in Electrical/Electronics Engineering Technology
Class Hours: 3 Lab Hours: 0 Credit Hours: 3

This course is a study of current topics related to electrical/electronics engineering technology. Technical aspects of practical applications are discussed.

Prerequisites: Permission of Department Head, Program Director, or Coordinator of Instructional Activities.

EGR 130 - Engineering Technology Applications and Programming
Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course covers the development and use of computer programs to solve engineering technology problems.

EGR 175 - Manufacturing Processes
Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course included the processes, alternatives, and operations in the manufacturing environment.

EGR 184 - Problem Based Integrated Technology I
Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This problem-based course focuses on the introduction of workplace skills such as problem solving, teamwork, computers, and communications and on applications of mathematics and science competencies. Various applications software, including CAD, will be utilized in the course.

EGR 194 - Statics and Strength of Materials
Class Hours: 3 Lab Hours: 3 Credit Hours: 4

This course covers external and internal forces in structures and/or machines, including conditions of equilibrium, systems of force, moments of inertia and friction. It also covers the stress/strain relationships in materials.

Prerequisites: MAT 170 and PHY 101 .

EGR 275 - Introduction to Engineering/Computer Graphics
Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course is a study of basic graphical concepts needed for engineering applications. These graphical concepts are presented through modeling and animation software.

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.

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.

MAT 171 - Algebra, Geometry and Trigonometry II
Class Hours: 3 Lab Hours: 0 Credit Hours: 3

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

Prerequisites: MAT 170 with a grade of C or better.

MET 224 - Hydraulics and Pneumatics
Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course covers basic hydraulics and pneumatic principles and circuits. System components such as pumps, compressors, piping, valves, cylinders, fluid motors, accumulators, and receivers are discussed.

Prerequisites: MAT 170 .

MET 238 - Lean Manufacturing
Class Hours: 4 Lab Hours: 0 Credit Hours: 4

This course covers the fundamentals of lean manufacturing techniques to be applied by mechanical engineering technicians and technologists. Topics include identification and elimination of waste, JIT, value-added principles, production leveling, and inventory management.

PHY 101 - Survey of Physics
Class Hours: 2 Lab Hours: 3 Credit Hours: 3

This course is a qualitative survey of the central concepts of physics with an emphasis on a conceptual rather than a mathematical viewpoint. This course includes concepts from classical mechanics, thermodynamics, electromagnetics and optics. Real life situations and hands-on laboratories will supplement lectures.

Prerequisites: Satisfactory reading and writing placement test scores for ENG 165 or completion of ENG 100 , ENG 101 , or ENG 155 with a grade of C or better. Completion of MAT 170 , MAT 109 , or MAT 110, 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.

TCTC
Tri-County Technical College