

# ROBOTICS TECHNOLOGY

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Electro-mechanical and mechatronics technologists and technicians test and operate machines in factories and at other worksites. They also document the tests they performed and analyze and record the results of those tests. Electro-mechanical and mechatronics technologists and technicians install, maintain, and repair automated machinery and computer-controlled mechanical systems in industrial settings. They also test, operate, or maintain robotic equipment at worksites. This equipment may include unmanned submarines, aircraft, or similar types of equipment for uses that include oil drilling, deep-ocean exploration, or hazardous-waste removal.

- Robotics Technology AAS Degree (<https://coursecatalog.tvcc.edu/pathways/service-production-industry/robotics/robotics-aas/>)
- Robotics Technology Certificate (<https://coursecatalog.tvcc.edu/pathways/service-production-industry/robotics/robotics-cert/>)

## **RBTC-1241. Vision Systems. (2 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. An overview of machine vision systems, including terminology and components. Topics include optics, sensors, lighting, image analysis, and user interfaces. Lab fee.

## **RBTC-1243. Robotics. (2 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Principles and applications of robots. Includes installation, interfacing, programming, maintenance, and safety of robots and robotic cells. Lab Fee.

## **RBTC-1245. Robot Interfacing. (2 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. A study of the basic principles of robot controllers, controller input/output, memory, and interfacing with computer integrated manufacturing. Lab fee.

## **RBTC-1305. Robotic Fundamentals. (3 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. An introduction to flexible automation. Topics include installation, repair, maintenance, and development of flexible robotic manufacturing systems. Lab fee.

## **RBTC-1341. Vision Systems. (3 Credits)**

An overview of machine vision systems, including terminology and components. Topics include optics, sensors, lighting, image analysis, and user interfaces.

## **RBTC-1343. Robotics. (3 Credits)**

Principles and applications of robots. Includes installation, interfacing, programming, maintenance, and safety of robots and robotic cells.

## **RBTC-1345. Robot Interfacing. (3 Credits)**

A study of the basic principles of robot controllers, controller input/output, memory, and interfacing with computer integrated manufacturing.

**RBTC-2239. Robot Programming and Diagnostics. (2 Credits)**

This course is taken for academic credit. Students will earn an A, B, C, D, F, or W. Emphasis on the programming of industrial robots, the development of programming techniques, and the diagnosis of faults in systems. Lab fee.

**What Electro-mechanical Technicians Do (<https://www.bls.gov/ooh/architecture-and-engineering/electro-mechanical-technicians.htm#tab-2>)**

Electro-mechanical technicians combine knowledge of mechanical technology with knowledge of electrical and electronic circuits. They operate, test, and maintain unmanned, automated, robotic, or electromechanical equipment.

**Duties**

Electro-mechanical technicians typically do the following:

- Read blueprints, schematics, and diagrams to determine the method and sequence of assembly of a part, machine, or piece of equipment
- Verify dimensions of parts, using precision measuring instruments, to ensure that specifications are met
- Operate metalworking machines to make housings, fittings, and fixtures
- Inspect parts for surface defects
- Repair and calibrate hydraulic and pneumatic assemblies
- Test the performance of electro-mechanical assemblies, using test instruments
- Install electronic parts and hardware, using soldering equipment and hand tools
- Operate, test, or maintain robotic equipment
- Analyze and record test results, and prepare written documentation

Electro-mechanical technicians test and operate machines in factories and other worksites. They also analyze and record test results, and prepare written documentation to describe the tests they performed and what the test results were.

Electro-mechanical technicians install, maintain, and repair automated machinery and computer-controlled mechanical systems in industrial settings. This kind of work requires knowledge and training in the application of photonics, the science of light. The technological aspects of the work have to do with the generation, control, and detection of the light waves so that the automated processes can proceed as designed by the engineers.

Electro-mechanical technicians also test, operate, or maintain robotic equipment at worksites. This equipment may include unmanned submarines, aircraft, or similar types of equipment for uses that include oil drilling, deep-ocean exploration, or hazardous-waste removal. These technicians also work on energy projects involving solar power and wind.

## **SUMMARY (<https://www.bls.gov/ooh/architecture-and-engineering/electro-mechanical-technicians.htm>)**

- Electro-mechanical technicians
- 2021 Median Pay: \$60,360 per year, \$29.02 per hour
- Typical Entry-Level Education: Associate's degree
- Work Experience in a Related Occupation: None
- On-the-job Training: None
- Number of Jobs, 2021: 12,100
- Job Outlook, 2021-31: -4% (decline)
- Employment Change, 2021-31: -400

### **Work Environment**

Electro-mechanical technicians work closely with electrical and mechanical engineers. They work in many industrial environments, including energy, plastics, computer and communications equipment manufacturing, and aerospace.

### **How to Become an Electro-mechanical Technician**

Electro-mechanical technicians typically need either an associate's degree or a postsecondary certificate.

### **Pay**

The median annual wage for electro-mechanical technicians was \$60,360 in May 2021.

### **Job Outlook**

Employment of electro-mechanical technicians is projected to have a 4% decline from 2021 to 2031.

### **State & Area Data**

Explore resources for employment and wages by state and area for electro-mechanical technicians.

### **Similar Occupations**

Compare the job duties, education, job growth, and pay of electro-mechanical technicians with similar occupations.

### **More Information, Including Links to O\*NET**

Learn more about electro-mechanical technicians by visiting additional resources, including O\*NET, a source on key characteristics of workers and occupations.

### **SUGGESTED CITATION:**

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Electro-mechanical Technicians, on the Internet at <https://www.bls.gov/ooh/architecture-and-engineering/electro-mechanical-technicians.htm> (visited May 28, 2023).

TVCC has partnered with **Career Coach** (<https://tvcc.emsicc.com/?radius=&region=10%20Mile%20Radius%20from%20Athens%2C%20TX>) for students to discover majors and in-demand careers and education based on your interests!

- Career Assessment Profiler
- Interactive Career Catalog
- Browse TVCC's Pathways

Some careers in this field will require a bachelor's degree.

- TVCC's AA degrees are fully transferable to public universities in Texas. See an academic advisor or TVCC's university transfer webpage (<https://www.tvcc.edu/Advisement/Category.aspx?z=72>) for more information on this transfer opportunity.
- Many of TVCC's AAS degrees lead to an online Bachelor of Applied Arts and Sciences (BAAS) degree with participating universities. See an academic advisor or the BAAS transfer website (<https://www.ntxccc.org/pathways/>) for more information on this transfer opportunity.