

Engineering Technologies Certificates



See specific program sections for Applied Science degrees in AMT, EET, EMEC, MECH and QA.

Computer Aided Drafting Technician Engineering Assembly Technician Engineering Technician Manufacturing Maintenance Technician

Engineering Technologies offers four focused certificates (see above) that lead to employment opportunities in technology areas. The certificate coursework and preparation means that the student can be gainfully employed earlier, and, in many instances, with companies that offer tuition reimbursement. These certificates can be combined and count toward an associate degree.

Computer Aided Drafting Technician Certificate

Drafters prepare technical drawings and plans used by production workers to build manufactured products. Drafters' drawings provide visual guidelines, show the technical details of the products, and specify dimensions, materials, and procedures. Drafters fill in technical details using drawings, rough sketches, specifications, codes, and calculations previously made by engineers or scientists. Some use their knowledge of engineering and manufacturing theory and standards to draw the parts of a machine to determine design elements, such as the numbers and kinds of fasteners needed to assemble the machine. Drafters use technical handbooks, tables, calculators, and computers to complete their work.

Traditionally, drafters sat at drawing boards and used pencils, pens, compasses, protractors, triangles, and other drafting devices to prepare a drawing manually. Most drafters now use Computer Aided Drafting and Design (CADD) systems to prepare drawings. Consequently, some drafters may be referred to as CADD operators. CADD systems employ computers to create and store drawings electronically that can then be viewed, printed, or programmed directly into automated manufacturing systems. These systems also permit drafters to prepare variations of a design quickly. Although drafters use CADD extensively, it is only a tool. Persons who produce technical drawings with CADD still function as drafters and need the knowledge of traditional drafters, in addition to CADD skills. Despite the nearly universal use of CADD systems, manual drafting and sketching still are used in certain applications.

Computer Aided Drafting Technician Certificate

COURSE	CR
Quarter 1	
ENGT 100 Introduction to Engineering Technology	4
MECH 112 Computer Applications in Manufacturing	3
MECH 115 Engineering Graphics.....	4
TOTAL CREDIT HOURS	11

Quarter 2	
EET 110 Electronic Engineering Technology Graphics	3
MECH 145 2D CAD	4
TOTAL CREDIT HOURS	6
MECH 145 2D CAD	4
TOTAL CREDIT HOURS.....	7

Quarter 3	
MECH 175 3D CAD	4
TOTAL CREDIT HOURS	4
TOTAL CREDIT HOURS	4

Quarter 4	
MECH 215 Parametric CAD	4
TOTAL CREDIT HOURS	4

TOTAL CERTIFICATE CREDIT HOURS.....	26
TOTAL CERTIFICATE CREDIT HOURS.....	25

Engineering Assembly Technician Certificate

Assemblers and fabricators play an important role in the manufacturing process. They are responsible for putting together finished and semi-finished goods, assembling the pieces of components of a product and then joining the components into a whole product.

Assemblers begin by reading detailed schematics or blueprints that show how to assemble complex machines. After determining how parts should connect, they often need to use hand or power tools to trim, shim, cut, and make other adjustments to make components fit together and align properly. Once the parts are properly aligned, they connect parts with bolts and screws or by welding or soldering pieces together. Careful quality control is important throughout the assembly process, so assemblers look for both mistakes in the assembly process and faulty components. They try to help fix problems before more defective products are produced.

Changes in technology have transformed the manufacturing and assembly process. Automated manufacturing systems now use robots, computers, programmable motion control devices, and various sensing technologies. These systems change the way in which goods are made and affect the jobs of those who make them. The more advanced assemblers must be able to work with these new technologies and be comfortable using them to produce goods.

Engineering Assembly Technician Certificate

COURSE	CR
Quarter 1	
ENGT 100 Introduction to Engineering Technology	4
MECH 240 Machine Tools	4
EET 110 Electronic Engineering Technology Graphics.....	3
MECH 112 Computer Applications in Manufacturing	3
TOTAL CREDIT HOURS	14

Quarter 2

EET 105	Basic Electronic Systems.....	5
QUAL 150	Quality Transformation.....	4
EET 154	Electronic Fabrication.....	3
MECH 115	Engineering Graphics.....	4
TOTAL CREDIT HOURS		16
TOTAL CERTIFICATE CREDIT HOURS		30

Engineering Technician Certificate

Engineering technicians use application-oriented principles of science, engineering, and mathematics to solve technical problems in research, development, and manufacturing. Their work is more limited in scope than that of scientists and engineers. Many engineering technicians assist engineers and scientists, especially in research and development. Others work in quality control, inspecting products and processes, conducting tests, or collecting data. In manufacturing, they may assist in product design, development, or production. Although many workers who repair or maintain various types of electrical, electronic, or mechanical equipment are called technicians, those interested in repair and maintenance should pursue the Manufacturing Maintenance Technician Certificate.

Engineering Technician Certificate

COURSE		CR
Quarter 1		
ENGT 100	Introduction to Engineering Technology	4
MECH 112	Computer Applications in Manufacturing	3
MECH 240	Machine Tools.....	4
EET 110	Electronic Engineering Technology Graphics	3
TOTAL CREDIT HOURS		14
Quarter 2		
MECH 150	Manufacturing Materials and Processes	4
MECH 115	Engineering Graphics.....	4
EET 105	Basic Electronic Systems.....	5
MATH 111	Technical Mathematics I.....	4
TOTAL CREDIT HOURS		17
Quarter 3		
EET 154	Electronic Fabrication.....	3
EET 115	Basic Digital Systems	5
MATH 112	Technical Mathematics II.....	4
TOTAL CREDIT HOURS		12
TOTAL CERTIFICATE CREDIT HOURS		43

Manufacturing Maintenance Technician

Certificate

Electrical equipment and electronic equipment are two distinct types of industrial equipment, although much equipment contains both electrical and electronic components. In general, electrical portions provide the power for the equipment, while electronic components control the device, although many types of equipment still are controlled with electrical devices. Electronic sensors monitor the equipment and the manufacturing process, providing feedback to the programmable logic controller (PLC), which controls the equipment. The PLC processes the information provided by the sensors and makes adjustments to optimize output. To adjust the output, the PLC sends signals to the electrical, hydraulic, and pneumatic devices that power the machine—changing feed rates, pressures, and other variables in the manufacturing process.

Many installers and repairers, known as field technicians, travel to factories (or other locations) to repair equipment or to perform preventive maintenance on a regular basis. Bench technicians work in repair shops located in factories and service centers, fixing components that cannot be repaired on the factory floor.

Manufacturing Maintenance Technician

Certificate

COURSE		CR
Quarter 1		
ENGT 100	Introduction to Engineering Technology	4
MECH 112	Computer Applications in Manufacturing	3
EET 105	Basic Electronics Systems	5
EMEC 250	Motors and Controls	4
TOTAL CREDIT HOURS		16
Quarter 2		
EET 115	Basic Digital Systems	5
MECH 243	Robotics	4
EMEC 251	Controls and Control Logic	4
MATH 111	Technical Mathematics I.....	4
TOTAL CREDIT HOURS		17
Quarter 3		
EET 125	Electronic Switching Systems.....	5
EET 255	Instrumentation and Controls.....	4
EMEC 260	PLC Programming	4
MATH 112	Technical Mathematics II.....	4
TOTAL CREDIT HOURS		17
TOTAL CERTIFICATE CREDIT HOURS		50

Engineering Technologies Courses

ENGT 100 Introduction to Engineering Technology (AU, SP, SU, W)

4 credits

This course is designed to introduce the beginning student to the Engineering Technology Department at Columbus State. The student will complete exploratory assignments in Mechanical Engineering Technology, Electro-Mechanical Engineering Technology, and Electronic Engineering Technology as well as get a broad overview of the jobs that engineering technologists and technicians have and the industries in which they work. Students will participate in engineer interviews and plant tours. Additional topics covered include the industrial revolution, manufacturing and electronics in today's global market, the future of manufacturing and electronics, and Steven Covey's book, "Seven Habits of Highly Effective People."

Lecture: 3 hours – Lab: 3 hours Lab fee: \$10.00

ENGT 131 Hydraulics and Pneumatics (WI, SU)

4 credits

This course is designed to give students a basic understanding of hydraulics and pneumatics. Students will learn about the components and functions of both systems and connect and troubleshoot both systems to meet a given set of criteria. Students will also be exposed to solenoid operated valves and their use in electrically controlling hydraulic and pneumatic systems. This course is required of Electro-Mechanical students and is an optional elective in the Mechanical program.

Lecture: 2 hours – Lab: 4 hours