

Automation Systems Technology

66-credit Associate of Applied Science Degree

About the Program

The Automation Systems Technology program helps meet the growing need for technicians to build, program, integrate, service and maintain automated and robotic systems. Students will study and use the latest robotics, electronics and automation systems. Graduates will be qualified to work with complex machinery that uses pneumatics, hydraulics, mechanical devices, electronic devices, robotics and industrial computers in automated production lines. A wide range of career paths will be open to students. Some technicians assist with installing and programming automated production lines or troubleshooting and servicing systems, and others provide technical support to sales departments.

Potential Job Titles

- Automation Systems Technician
- Electromechanical Technician
- Field Service Technician
- Controls Technician
- Systems Designer
- Technical Salesperson
- Maintenance Technician

Credit Transfer

Credits earned in the Automation Systems Technology program may be transferable to institutions offering baccalaureate degrees. Visit www.wctc.edu/transfer for specific information. Since the details of credit transfers change from time to time, be sure to contact the intended college or university to verify credit transferability.

Admission Process

- Fill out a WCTC application
- Send \$30 non-refundable application fee
- Send high school transcript or GED/HSED
- Send any previous college transcripts
- Complete Skills Assessment test (COMPASS)
- Begin pursuing Financial Aid options
- Transcribed credit agreements are in effect with several Waukesha County high schools
- A minimum of two years of high school math is recommended

For more information, call 262.691.5200.

Required Courses	Credits
First Semester	
605-102 Introduction to Electronics	3
605-118 Digital Electronics	3
612-104 Basic Fluid Power	3
801-195 Written Communication	3+
804-115 College Technical Math I	5+
Total semester credits	17
Second Semester	
462-100 Mechanical Repair	3
605-127 Electronic Fabrication Techniques	2
605-129 Electrical Power, Controls & Motors	3
605-138 Solid State Devices for Automation	2
605-188 PLC I	2
801-196 Oral/Interpersonal Communication	3+
806-139 Survey of Physics	3
Total semester credits	18
Third Semester	
605-139 Industrial PC Systems	3
605-189 PLCS II	2
605-196 Drives and Intro to Servos	2
605-197 Sensors and Process Control	2
809-195 Economics	3+
Elective	3
Total semester credits	15
Fourth Semester	
606-153 Co-op Education I-Industrial	1
664-160 Robotics and Servo Control	3
664-161 Automation Systems	3
809-196 Introduction to Sociology	3+
809-199 Psychology of Human Relations	3
Elective	3
Total semester credits	16
+ Proficiency exam available	
<i>Curriculum is current as of catalog printing. The most current curriculum requirements for graduation will be provided upon admission to program, or review at www.wctc.edu.</i>	

**Automation Systems Technology
Required Courses**

462-100 Mechanical Repair 3

Gain the basic knowledge and skills required of technicians in industrial settings. Explore safety techniques, and learn the properties and use of hand and power tools, fasteners, drives (gear, chain and belt), ball screws, couplings, pump and valve packings and seals, lubrication, and bearings. Discuss basic machine installation, alignment, and leveling.

605-102 Introduction to Electronics 3

Explore basic concepts and theories of direct and alternating current circuits, including the application of Ohm's Law, Watt's Law, and Kirchoff's Law to series, parallel, and series-parallel circuits. Apply concepts to power supply circuits and learn proper use of voltmeters, ohmmeters, and oscilloscopes.

605-118 Digital Electronics 3

Study practical digital electronics including basic logic components such as gates and inverters and the more complex logic devices such as multiplexers, demultiplexers, and analog/digital and digital/analog converters. Explore the basic concepts of microprocessors.

605-127 Elect Fabrication Techniques 2

Build some of the electronic fabrication and repair knowledge and skills a technician is expected to possess. Study the areas of wire preparation and termination, soldering and desoldering, wire bundling and routing, and printed circuit board inspection, cleaning, and repair.
Prerequisites: 662-102 DC Circuit Analysis or 605-113 DC Electronics or 605-102 Introduction to Electronics

605-129 Elect Pwr Ctrl & Motors 3

Study power distribution circuits including transmission substation (high voltage), distribution substation (medium voltage), and in-plant distribution. Explore the construction and operation of DC motors and single-phase and three-phase AC motors. Become familiar with elementary industrial control circuits. Construct, wire, test, and operate a typical industrial control panel.
Prerequisites: 605-102 Introduction to Electronics

605-138 SS Devices for Automation 2

Become familiar with semiconductor materials and the operation of components such as diodes, transistors, and IGBTs in industrial control circuits.
Prerequisites: 605-118 Digital Electronics and 605-102 Introduction to Electronics

605-139 Industrial PC Systems 3

Examine the basic operation, programming, and applications of personal computers and their associated devices in industrial systems. Study PC-based systems, I/O cards, interconnections, microprocessor hardware, architecture, and software in relation to typical data acquisition applications. Write Lab View and Visual Basic language programs to interface the microprocessor to external devices used in industrial systems.
Prerequisites: 605-138 SS Devices for Automation

605-188 PLC I 2

Study programmable logic controllers related to basics and start up, PLC wiring, ladder diagram networks, and basic programming.
Prerequisites: 605-129 Elect Pwr Ctrl & Motors (or concurrent)

605-189 PLCS II 2

Explore advanced programming concepts while discussing topics such as PLCs connected to networks, device net, and analog I/O. Wire and test programmable logic controllers during instruction.
Prerequisites: 605-188 PLC I

605-196 Drives and Intro to Servos 2

Explore the basics of DC and AC drives, including operational controls, characteristics, drive functionality, and PC and field bus interfacing. Gain hands-on experience in drive set-up and wiring, and become familiar with servo control during lab work. Learn safe troubleshooting and testing practices.
Prerequisites: 605-138 SS Devices for Automation

605-197 Sensors and Process Control 2

Build an understanding of industrial sensors including limit, Hall-Effect, photoelectric, and proximity switches that detect the absence, presence, or distance of an object from a reference point. Explore instrumentation, the operational theory and elements of open-loop and closed-loop systems, and the calibration of process control and flow metering devices.
Prerequisites: 605-138 SS Devices for Automation

606-153 Co-op Educ I-Ind 1

Gain a meaningful occupational experience. Hone technical competencies and interpersonal relationships that are stressed in seminars.
Prerequisites: Approval of Co-op Ed Office

612-104 Basic Fluid Power 3

Study the construction, characteristics, cost, advantages, disadvantages, and typical applications of each component in a hydraulic system. Design and build a circuit to solve a given problem.

664-160 Robotics and Servo Control 3

Explore the topics of safety, robotic terminology, types of robots, a robots parts, axis and rotation, end effectors, and applicable sensors. Practice using robots while studying their operation, basic programming, and applications.
Prerequisites: 605-189 PLCS II and 605-197 Sensors and Process Control

664-161 Automation Systems 3

Use competencies learned throughout the program to operate and interface mechanical, digital, PLC, fluid power, servomechanism, and robotic systems. Discuss the start up and shut down of automated systems, as well as concepts related to current technology in the field of electro-mechanical systems. Explore the principles of safety, lock-out tag-out, documentation, and communication with systems stakeholders.
Prerequisites: 605-139 Industrial PC Systems and 605-196 Drives and Intro to Servos and 605-197 Sensors and Process Control and 664-160 Robotics and Servo Control (or concurrent)

801-195 Written Communication 3

Study and practice the transfer of information, ideas, and experiences in written form through reports, letters, memoranda, and other documents. Gain proficiency in the areas of organization, clarity, accuracy, and directness.
Prerequisites: COMPASS-Writing Skills or ACT-English or ASSET-Writing Skills or Accuplacer Sentence Skills or TABE Advanced Language or 831-103 Intro to College Writing or 851-771 Writing-Program Readiness

801-196 Oral/Interpersonal Comm 3

Practice the necessary skills for effective speech delivery, listening, assertiveness, conflict resolution, teamwork, and general interpersonal communication.

804-115 College Technical Math 1 5

Topics include: solving linear, quadratic, and rational equations; graphing; formula rearrangement; solving systems of equations; percent; proportions; measurement systems; computational geometry; right and oblique triangle trigonometry; trigonometric functions on the unit circle; and operations on polynomials. Emphasis will be on the application of skills to technical problems. This course is the equivalent of successful completion of College Technical Mathematics 1A and College Technical Mathematics 1B.

806-139 Survey of Physics 3

Emphasis is on understanding basic physics concepts through laboratory investigation and applications. Topics include kinematics, dynamics, work, energy, power, temperature, heat, waves, electricity, magnetism, electromagnetic waves, optics, and atomic and nuclear physics.
Prerequisites: 804-115 College Technical Math 1 or 804-151 Technical Math I or 804-170 Math for Electronics or 804-110 Elem Algebra w Apps (or concurrent) or 804-106 Intro to College Math (or concurrent)

809-195 Economics 3

Discuss the major institutions and principles that underlie the contemporary American economic system, and consider topics such as the free enterprise system, supply and demand, circular flow, government involvement, the Federal Reserve System, economic growth and development, the effects of international trade, comparative economic systems, and global economics.
Prerequisites: COMPASS-Reading Skills or 858-775 Reading - Program Readiness or 838-105 Intro Reading & Study Skills or TABE Advanced Reading or Accuplacer Reading Comprehensi or College Proficiency - Reading or Grandfathered Rdg Requirement or ACT-Reading

809-196 Introduction to Sociology 3

Learn the basic concepts of sociology: culture, socialization, social stratification, multiculturalism, and the five institutions, including family, government, economics, religion, and education. Other topics include demography, deviance, technology, environment, social issues, social change, social organization, and workplace issues.
Prerequisites: COMPASS-Reading Skills or 858-775 Reading - Program Readiness or 838-105 Intro Reading & Study Skills or TABE Advanced Reading or Accuplacer Reading Comprehensi or College Proficiency - Reading or Grandfathered Rdg Requirement or ACT-Reading

809-199 Psychology of Human Relations 3

Examine the principles of interaction as applied to human relations at home and on the job. Explore topics such, as self concept personality development, learning, motivation, emotions, stress, human relations processes, and special relationships.
Prerequisites: COMPASS-Reading Skills or 858-775 Reading - Program Readiness or 838-105 Intro Reading & Study Skills or TABE Advanced Reading or Accuplacer Reading Comprehensi or College Proficiency - Reading or Grandfathered Rdg Requirement or ACT-Reading

Elective Options

Any course at the associate degree level will meet the elective requirement.