# AUTOMATION AND INDUSTRIAL TECHNOLOGY

The Automation and Industrial Technology (AIT) program is a program of study that employs the principles of industrial maintenance technology integration through two tracks and multiple certificates. The AAS Tracks include Automation Technician Track and Multi-Skilled Maintenance Technician Track. The certificates offered are listed below:

- Electrical Maintenance Technician
- Automation Engineering Controls
- Industrial Mechanic
- Multi-Skilled Maintenance Apprenticeship
- Multi-Skilled Technician Trainee Level I
- Multi-Skilled Technician Trainee Level II
- Skilled Operator
- Utility Technician

Within each track and certificate, a systems approach is employed that is congruent with the expectations of regional employers. The AIT program offers both online coursework and a flexible in-person lab schedule.

The AIT graduate will acquire a high-level mechanical, electrical, and/or automation skill set that can provide themselves opportunities to work in today's technically advanced industrial settings (both in manufacturing and value-added 2nd tier support roles).  These skill sets include:

- Advanced electric motor control analysis and troubleshooting
- Hydraulics/pneumatic control analysis and troubleshooting
- Mechanical drive systems installation and troubleshooting
- Peripheral control device programming
- Predictive and preventive maintenance
- Process control evaluation and tuning
- Robotics and PLC programming
- Schematic and blueprint reading

The curriculum addresses mechanical and electrical theory and its application in today's industrial environment. Critical thinking objectives that expose the student to problem-solving strategies and techniques for troubleshooting state-of-the-art manufacturing equipment are also incorporated.

Students enrolled in the Automation and Industrial Technology Program are required to achieve a minimum grade of "C" in technical core courses.

## Degrees

- Automation and Industrial Technology - AAS (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/automation-and-industrial-technology-aas/)
  - Automation Technician Track (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/automation-and-industrial-technology-aas/#automationtechniciantrack)
  - Multi-Skilled Maintenance Technician Track (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/automation-and-industrial-technology-aas/#multiskilledmaintenancetechniciantrack)

## Certificates

- Ammonia Refrigeration Fundamentals - Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/ammonia-refrigeration-fundamentals-certificate/)
- Automation Engineering Controls - Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/automation-engineering-controls-certificat/)
- Electrical Maintenance Technician - Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/electrical-maintenance-technician-certificate/)
- Industrial Mechanic - Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/industrial-mechanic-certificate/)
- Industrial Refrigeration - Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/industrial-refrigeration-certificate/)
- Multi-Skilled Maintenance Apprenticeship - Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/multi-skilled-maintenance-apprenticeship-certificate/)
- Multi-Skilled Technician Trainee Level I - Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/multi-skilled-technician-trainee20level-i-certificate/)
- Multi-Skilled Technician Trainee Level II- Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/multi-skilled-technician-trainee-level-ii-certificate/)
- Skilled Operator - Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/skilled-operator-certificate/)
- Utility Technician - Certificate (https://catalog.kctcs.edu/programs-of-study/aas/automation-and-Industrial-technology/utility-technician-certificate/)

## Automation and industrial Technology Technical Electives

| Course | Title | Credits |
| --- | --- | --- |
| ACR 100 | Refrigeration Fundamentals | 3 |
| ACR 101 | Refrigeration Fundamentals Lab | 2 |
| ACR 102 | HVAC Electricity | 3 |
| ACR 103 | HVAC Electricity Lab | 2 |
| ACR 112 | Sheet Metal Fabrication | 3 |
| ACR 113 | Sheet Metal Fabrication Lab | 2 |
| ACR 130 | Electrical Components | 3 |
| ACR 131 | Electrical Components Lab | 2 |
| ACR 170 | Heat Load/Duct Design | 3 |
| ACR 200 | Commercial Refrigeration | 3 |
| ACR 201 | Commercial Refrigeration Lab | 2 |
| ACR 206 | Boilers | 5 |
| ACR 207 | Commercial HVAC Systems | 5 |
| ACR 208 | Chillers | 4 |
| ACR 209 | Manual N Commercial Load Calculation and Design | 4 |
| ACR 210 | Ice Machines | 3 |

| Code | Title | Credits | Code | Title | Credits |
|------|-------|---------|------|-------|---------|
| ACR 237 | Building Controls I | 5 | CMM 112 | Fundamentals of Machine Tools - B | 3 |
| ACR 238 | Building Controls II | 5 | CMM 118 | Metrology/Control Charts | 2 |
| ACR 250 | Cooling and Dehumidification | 3 | CMM 124 | Applied Machining | 6 |
| ACR 251 | Cooling and Dehumidification Lab | 2 | CMM 134 | Manual Programming CAD/CAM/CNC | 6 |
| ACR 260 | Heating and Humidification | 3 | CMM 214 | Industrial Machining | 6 |
| ACR 262 | Heating and Humidification Lab | 2 | CMM 224 | Advanced Industrial Machining | 6 |
| ACR 270 | Heat Pump Application | 3 | CMM 230 | Conversational Programming | 6 |
| ACR 271 | Heat Pump Application Lab | 2 | CMM 240 | Introduction to 3-D Programming | 6 |
| ACR 290 | Journeyman Preparation | 3 | DPT 100 | Introduction to 3D Printing Technology | 3 |
| ACR 291 | Special Problems I | 1 | DPT 150 | Introduction to Engineering Mechanics for 3D Printing | 3 |
| ACR 293 | Special Problems II | 2 | DPT 280 | Special Projects for 3D Printing, Level I | 1 |
| ACR 295 | Special Problems III | 3 | FRM 100 | Fundamentals of Fermentation | 1 |
| ACR 298 | Practicum | 2 | FRM 110 | Principles of Fermentation Science | 3 |
| ACR 299 | Cooperative Education Program | 2 | FRM 120 | Brewery Facilities and Operational Management | 4 |
| ADX 120 | Basic Automotive Electricity | 3 | FRM 160 | Beverage Packaging | 2 |
| ADX 121 | Basic Automotive Electricity Lab | 2 | EET 127 | Electrical Technology Capstone | 1 |
| ADX 150 | Engine Repair | 3 | EET 154 | Electrical Construction I | 2 |
| ADX 151 | Engine Repair Lab | 2 | EET 155 | Electrical Construction I Lab | 2 |
| ADX 170 | Climate Control | 3 | EET 250 | National Electrical Code | 4 |
| ADX 171 | Climate Control Lab | 1 | EET 252 | Electrical Construction II | 2 |
| ADX 260 | Electrical Systems | 3 | EET 253 | Electrical Construction II Lab | 2 |
| ADX 261 | Electrical Systems Lab | 2 | EET 264 | Rotating Machinery | 2 |
| AGR 115 | Agriculture Maintenance | 3 | EET 265 | Rotating Machinery Lab | 2 |
| AGR 150 | Agricultural Power | 3 | EET 270 | Electrical Motor Controls I | 2 |
| AGR 170 | Introduction to Equipment, Machines, and Engines | 3 | EET 271 | Electrical Motor Controls I Lab | 2 |
| AET 190 | Industrial Computer Programming Concepts | 4 | EET 272 | Electrical Motor Controls II | 2 |
| AET 250 | PLC Networking | 4 | EET 273 | Electrical Motor Controls II Lab | 2 |
| AET 270 | Advanced PLC Programming | 4 | ELT 110 | Circuits I | 5 |
| AIT 135 | Industrial Refrigeration - I | 3 | ELT 250 | Programmable Logic Controllers | 4 |
| AIT 145 | Utility Technician I | 6 | IMT 100 | Welding for Maintenance | 3 |
| AIT 160 | Workplace Safety | 1 | IMT 101 | Welding for Maintenance Lab | 2 |
| AIT 200 | Process Management and Quality Control | 4 | PLW 100 | Introduction to Engineering Design | 4 |
| AIT 220 | | | PLW 125 | Principles of Engineering | 4 |
| AIT 230 | | | TRU 100 | Truck Driving | 6 |
| AIT 235 | Industrial Refrigeration - II | 3 | WLD 100 | Oxy-Fuel Systems | 2 |
| AIT 245 | Utility Technician II | 6 | WLD 101 | Oxy-Fuel Systems Lab | 2 |
| AIT 290 | Selected Topics in Advanced Integrated Technology | 0.1-5 | WLD 120 | Shielded Metal Arc Welding | 2 |
| AIT 299 | | | WLD 121 | Shielded Metal Arc Welding Fillet Lab | 3 |
| AUT 110 | Brake Systems | 3 | WLD 123 | Shielded Metal Arc Welding Groove with Backing Lab | 3 |
| AUT 111 | Brake Systems Lab | 2 | WLD 130 | Gas Tungsten Arc Welding | 2 |
| AUT 160 | Suspension and Steering | 3 | WLD 131 | Gas Tungsten Arc Welding Fillet Lab | 3 |
| AUT 161 | Suspension and Steering Lab | 2 | WLD 140 | Gas Metal Arc Welding | 2 |
| BAS 160 | Introduction to Business | 3 | WLD 141 | Gas Metal Arc Welding Fillet Lab | 3 |
| BRX 110 | Basic Blueprint Reading for Machinist | 2 | WLD 143 | Gas Metal Arc Welding Groove Lab | 3 |
| BRX 120 | Basic Blueprint Reading | 3 | WLD 170 | Blueprint Reading for Welding | 2 |
| BRX 210 | Mechanical Blueprint Reading | 2 | WLD 171 | Blueprint Reading for Welding Lab | 3 |
| BTS 120 | Essentials of Biomedical Electronics I | 2 | WLD 198 | Special Topics in Welding | 1-6 |
| BTS 125 | Essentials of Biomedical Electronics II | 2 | WLD 220 | Welding Certification | 2 |
| CAD 100 | Introduction to Computer Aided Design | 3 | WLD 221 | Welding Certification Lab | 3 |
| CAD 200 | Intermediate Computer Aided Drafting | 4 | WLD 225 | Shielded Metal Arc Welding Open Groove Lab | 3 |
| CMM 110 | Fundamentals of Machine Tools - A | 3 | | | |

| WLD 298 | Welding Practicum | 1-6 |
| WLD 299 | Cooperative Education Program | 1-6 |