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# Heating, Ventilation, Air Conditioning, and Refrigeration

## Degree Pathway

A Certificate is outlined coursework that is designed to prepare a student to head out into the workforce in a short timeframe or for career advancement. This certificate totals 42 credit hours. Consult with an advisor for more information.

(T) are Systemwide Transfer Courses

(★) are recommended for this degree pathway.

Required Courses			
Course ID	Course Title	Credit Hours	Notes
AE100	AC/DC Circuits	4.00	Fall, Spring
AE150	Programmable Logic Controls (PLCs)	3.00	Fall, Spring Prereq: AE100 AC/DC Circuits.
AE155	Electrical Maintenance	3.00	Fall, Spring Prereq: AE100 AC/DC Circuits.
ME110	Fundamentals of Motor Controls	3.00	Fall, Spring Prereq: AE100 AC/DC Circuits.
ME112	Heating System Fundamentals	3.00	Fall, Spring
ME115	HVAC Fundamentals	4.00	Fall, Spring
ME116	Commercial Refrigeration	4.00	Spring
ME117	Commercial Heating and Air Conditioning	4.00	Spring Prereq: ME115 HVAC Fundamentals, and EE203 Instruments & Measurements, or ME116 Commercial Refrigeration.
ME131	EPA 608	1.00	Fall
ME132	HVAC Load Calculations	1.00	Fall
ME133	HVAC Duct Sizing	1.00	Fall
ME134	HVAC Code Requirements	1.00	Fall
ME140	Low Pressure Boilers	3.00	Spring
TR100	Technical Math	3.00	Fall, Spring
Electives			
Course ID	Course Title	Credit Hours	Notes
<b>HVAC Technical Electives</b>		<b>3.00</b>	
AE105	Industrial Wiring	3.00	Spring
AE200	Variable Frequency Drives and Electric Motors	3.00	Fall, Spring Prereq: ME110 Fundamentals of Motor Controls.
AE202	Actuator/Sensor Systems	3.00	Fall, Spring Prereq: AE155 Electrical Maintenance.
AE205	Intermediate Programmable Logic Controllers	3.00	Fall, Spring Prereq: AE150 Programmable Logic Controllers.
AE250	Distributed/Integrated Control Systems	3.00	Spring Prereq: AE200 Variable Frequency Drives & Electric Motors, or AE205 Industrial PLCs.
AE252	Control Systems Development	3.00	Fall, Spring Prereq: AE200 Variable Frequency Drives & Electric Motors, or AE205 Industrial PLCs.

AE255	Industrial Robotics	3.00	Fall, Spring Prereq: AE150 Programmable Logic Controllers.
ME106	Industrial Fluid Power	3.00	Fall, Spring
ME114	Renewable Energy Technology	3.00	
ME118	Renewable Energy Technology Systems Analysis	4.00	Prereq: ME114 Renewable Energy Technology, and AE155 Electrical Maintenance, and ME115 HVAC Fundamentals.
ME124	Renewable Energy Technology Maintenance	4.00	Prereq: ME114 Renewable Energy Technology, and AE155 Electrical Maintenance, and ME115 HVAC Fundamentals.
ME125	Engineering Technology Internship	3.00	
ME129	Mechanical Maintenance Skills	3.00	Fall, Spring
TR120	Work Ethics	2.00	Fall, Spring, Summer
WE100	Basic Welding	3.00	Fall, Spring
WE101	Welding Safety	1.00	Fall
WE102	Welding Blueprint Reading	3.00	Fall, Spring
WE104	Shielded Metal Arc Welding	3.00	Fall
WE105	Shielded Metal Arc Welding II	3.00	Fall, Spring Prereq: WE104 SMAW w/Grade of C or Higher, or Departmental Consent.
WE106	Cutting Processes for Welding	2.00	Fall
WE110	Gas Metal Arc Welding	3.00	Fall, Spring
WE111	Gas Metal Arc Welding II	3.00	Fall, Spring Prereq: WE110 Gas Metal Arc Welding w/Grade of C or Higher.
WE112	Gas Tungsten Arc Welding	3.00	Fall, Spring
WE113	Gas Tungsten Arc Welding II	3.00	Spring Prereq: WE112 GTAW w/Grade of C or Higher.
WE128	Welding Metallurgy	2.00	Fall, Spring
WE209	Welding Fabrication Processes	4.00	Fall Prereq: Departmental Consent.
<b>Industrial Safety Electives</b>		<b>1.00</b>	
★ TR121	General Industrial Safety/OSHA10	1.00	Fall, Summer

**Total Credits: 42.00**