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## Heating, Ventilation, Air Conditioning, and Refrigeration - CERT B

### Semester-by-Semester 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. Not all courses are offered each semester.

(T) are Systemwide Transfer Courses

(★) are recommended for this degree pathway.

Semester 1 - Fall				
Complete	Course ID	Course Title	Credit Hours	Notes
Required Courses				
	AE100	AC/DC Circuits	4.00	Fall, Spring
	ME115	HVAC Fundamentals	4.00	Fall, Spring
	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
Electives				
	Industrial Safety Electives		1.00	
Semester Total:			16.00	

Semester 2 - Spring				
Complete	Course ID	Course Title	Credit Hours	Notes
Required Courses				
	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.
	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.
Electives				
Semester Total:			17.00	

### Semester 3 - Fall

Complete	Course ID	Course Title	Credit Hours	Notes
Required Courses				
	ME112	Heating System Fundamentals	3.00	Fall, Spring
	TR100	Technical Math	3.00	Fall, Spring
Electives				
	HVAC Technical Electives		3.00	
Semester Total:			9.00	

**Total Credits: 42.00**

\*Semester offerings reflect the current academic year.

HVAC Technical Electives			
Course ID	Course Title	Credit Hours	Notes
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	Fall
ME129	Mechanical Maintenance Skills	3.00	Fall, Spring
TR120	Work Ethics	2.00	Fall, Spring
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.

Industrial Safety Electives			
Course ID	Course Title	Credit Hours	Notes
★ TR121	General Industrial Safety/OSHA10	1.00	Fall