

Heating, Ventilation and Air Conditioning/Refrigeration Technology

GRCC HVAC Program

Heating and air-conditioning equipment make buildings comfortable for work, study or play. Refrigeration equipment makes it possible to safely store foods, medicines, and other items. The equipment that provides these conveniences is complex. Heating, ventilation and air conditioning/refrigeration technicians are skilled workers who install, maintain, troubleshoot and repair heating and cooling equipment. Much of the equipment with which they work is computer controlled. Technicians in this field are often employed to design, manufacture, install, sell and service equipment that regulates interior temperatures of buildings. They often specialize in one area, and may work both outdoors and indoors.

Students in GRCC's program learn the theory and become proficient in the skills necessary to assume jobs as heating, ventilation and air conditioning/refrigeration service and installation technicians. They take at least two laboratory courses in various specialties every semester.

Courses may be taken in any order as long as all requirements (including prerequisites) are met. Students entering this program should meet the college's minimum entrance requirements in Reading, Mathematics and English.

First Year Certificate - Days

<u>First Semester</u> (Suggested Sequence)	Credits	<u>Second Semester</u> (Suggested Sequence)	Credits
HVA 110 Basic Refrigeration	(2/4)	HVA 135 Heating Theory	(2/4)
HVA 111 Refrigeration Applications	(2/4)	HVA 136 Air Conditioning Theory	(2/4)
HVA 128 Heating and Cooling Controls	(3/6)	HVA 174 HVAC Blueprint Reading and Design	(3/4)
HVA 230 HVACR Electronic Controls	(3/4)	HVA 121 Metallic and Non-Metallic Joining	(2/4)
HVA 250 Basic Boiler Operation	(3/4)	HVA 221 Duct Construction and Design	(3/6)
HVA 275 Commercial Refrigeration	(3/4)	HVA 246 Mechanical Codes	(2/2)
		HVA 276 Advanced HVAC	(3/4)
Total Credits 16 Minimum		Total Credits 17 Minimum	

Second Year Associate Degree - Days (Transferable to Ferris State University)

<u>Third Semester</u> (Suggested Sequence)		<u>Fourth Semester</u> (Suggested Sequence)	
Program Elective 1	(3/3)	Program Elective 2	(3/3)
Lab Science Elective (min. of 4 credits)	(4/6)	HUM Humanities Elective (min. of 3 credits)	(3/3)
TE 103 Inter. Technical Mathematics	(4/4)	EN102 English Composition 2	(3/3)
MA 107 Inter. Algebra or Higher Math	(4/4)	PS 110 Survey of American Government	(3/3)
EN 100 College Writing	(3/3)	WE_ Wellness Elective (min. of 1 credit)	(1/2)
EN 101 English Composition 1	(3/3)		
Total Credits 14 Minimum		Total Credit 13 Minimum	

Program Electives (min. of 6 credits)

CIS 103 Introduction to Windows and Microsoft Office
 EG 110 Industrial Graphics with CAD
 EL 144 Basic Electricity and Electronics
 EL 162 Control Systems
 HVA 260 Geothermal HVAC Systems
 HVA 280 HVAC Internship
 MN 116 Basic Welding
 TE 104 Advanced Technical Mathematic



Total Program Credits: 60 Minimum

Heating, Ventilation and Air Conditioning/Refrigeration Technology First Year Class Sequencing – Days

First Semester Class Sequence		
Start of Semester		
	HVA110	HVA111
	HVA128	HVA230
	HVA250	
End of Semester		

Second Semester Class Sequence		
Start of Semester		
	HVA135	HVA136
	HVA121	HVA221
	HVA246	
	HVA174	
End of Semester		