



DEPARTMENT OF
HIGHER EDUCATION &
WORKFORCE DEVELOPMENT

New Program Report

Date Submitted:

04/20/2023

Institution

Ranken Technical College

Site Information

Implementation Date:

8/28/2023 12:00:00 AM

Added Site(s):

Selected Site(s):

Ranken Southeast, 1205 Corporation Lane, Perryville, MO, 63775

Ranken Technical College, 4431 Finney Avenue, St. Louis, MO, 63113

CIP Information

CIP Code:

150501

CIP Description:

A program that prepares individuals to apply basic engineering principles and technical skills in support of engineers and other professionals engaged in developing and using air conditioning, refrigeration, ventilation, and heating systems. Includes instruction in principles of heating and cooling technology, design and operational testing, inspection and maintenance procedures, installation and operation procedures, and report preparation.

CIP Program Title:

Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician

Institution Program Title:

Heating, Ventilation, Air Conditioning and Refrigeration Technology

Degree Level/Type

Degree Level:

Associate Degree

Degree Type:

Associate of Science

Options Added:

Collaborative Program:

N

Mode of Delivery

Current Mode of Delivery

Hybrid

Student Preparation



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Special Admissions Procedure or Student Qualifications required:
See attachment

Specific Population Characteristics to be served:
See attachment

Faculty Characteristics

Special Requirements for Assignment of Teaching for this Degree/Certificate:
See attachment

Estimate Percentage of Credit Hours that will be assigned to full time faculty:
See attachment

Expectations for professional activities, special student contact, teaching/learning innovation:
See attachment

Student Enrollment Projections Year One-Five

Year 1	Full Time: 2	Part Time: 0	
Year 2	Full Time: 2	Part Time: 0	
Year 3	Full Time: 2	Part Time: 0	Number of Graduates: 2
Year 4	Full Time: 2	Part Time: 0	
Year 1	Full Time: 2	Part Time: 0	
Year 2	Full Time: 2	Part Time: 0	
Year 3	Full Time: 2	Part Time: 0	Number of Graduates: 2
Year 4	Full Time: 2	Part Time: 0	
Year 5	Full Time: 2	Part Time: 0	Number of Graduates: 2

Percentage Statement:
n/a

Program Accreditation

Institutional Plans for Accreditation:
See attachment

Program Structure

Total Credits:
97

Residency Requirements:
Minimum of 38 credit hours must be earned at Ranken Technical College.

General Education Total Credits:
39



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Major Requirements Total Credits:

58

Course(s) Added

COURSE NUMBER	CREDITS	COURSE TITLE
HVA 2110	9	Commercial Refrigeration and Light Commercial Heat/AC
HVA 1155	5	HVA Internship I
HVA 2015	5	HVA Internship II
HVA 2115	5	HVA Internship III
HVA 1000	16	Fundamentals of Refrigeration and Electrical
HVA 1150	9	Mechanical Applications
HVA 2010	9	Residential Heat/AC and Heat Pumps

Free Elective Credits:

0

Internship or other Capstone Experience:

N/A

Assurances

I certify that the program will not unnecessarily duplicate an existing program of another Missouri institution in accordance with 6 CSR 10-4.010, subsection (9)(C) Submission of Academic Information, Data and New Programs.

I certify that the program will build upon existing programs and faculty expertise.

I certify that the institution has conducted research on the feasibility of the proposal and it is likely the program will be successful. Institutions' decision to implement a program shall be based upon demand and/or need for the program in terms of meeting present and future needs of the locale, state, and nation based upon societal needs, and/or student needs.

Contact Information

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From: Shannon C. Brueggemann

Sent: Friday, March 17, 2023 1:43 PM

Cc: Ryan D. Howard <rdhoward@ranken.edu>; David Cadle <dacadle@ranken.edu>; Julia M. Bradshaw <jmbradshaw@ranken.edu>; Charles G. Corrigan <cgcarrigan@ranken.edu>

Subject: HVAC/MAT Change for 2023-2024

The Education Committee recently approved the following changes to the Heating, Ventilation, Air Conditioning, and Refrigeration Technology and Major Appliance Technology at the St. Louis Location effective Fall 2023. Starting in Fall 2023, the Heating, Ventilation, Air Conditioning, and Refrigeration Technology will be offered at the Perryville location. (See Attachment)

Heating, Ventilation, Air Conditioning, and Refrigeration Technology

- DAY Program: Changes
 - 2nd-4th Semesters – Students rotate between 8-week seated courses and 8-week internship courses
 - Eliminates various emphases previously tied to the HVAC degree.
 - The first and second semesters of the previous HVAC program are combined into one semester.
 - The second semester course includes natural gas components per request of Spire.
 - NOTE: Fall 2023 all students must enroll under AT/AS. Student may transition to CTT in January 2024.
 - NOTE: Offered in PRY in Fall 2023.

Major Appliance Technology

- DAY Program: Changes
 - 2nd-4th Semesters – Students rotate between 8-week seated courses and 8-week internship courses
 - Now an individual degree.
 - Students may dual degree with MAT & HVAC by adding a 5th semester.
 - Students in the Spire apprenticeship program must enroll into the MAT degree and their internships will be coded under the UMT Course Code.
 - NOTE: Fall 2023 all students must enroll under AT/AS. Student may transition to CTT in January 2024.

Books & Tools forms are in the process of getting revised under the new Course Codes.

Please let me know if you have questions or concerns.

Shannon Brueggemann
Vice President for Education

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CHANGE: EMBED INTERNSHIPS INTO THE HVAC/MAT DEGREES IN DAY PROGRAM

Changes:

- Embedded Internships – Accommodates the numerous requests from industry to incorporate internships
- Return to separated HVACR and MAT degrees – Removes the numerous emphases that complicate financial aid when students want to pursue more than one emphasis. Students will be able to dual degree in HVACR & MAT by adding that additional semester.
- Remove Utility Maintenance Emphasis – Incorporates additional natural gas elements in general HVAC program eliminating separate courses for Spire students, which removes a drain on resources in the department from small classes. The removal of that 5th semester for Spire students should result in more interest in students wanting to enter their apprenticeship program due to decrease in cost and time.
- Offering HVAC degree in Perryville beginning in August 2023

Heating, Ventilation, Air Conditioning and Refrigeration Technology

AT/AS/CTT

			Credits	Prerequisites
1st Semester	HVA 1000	Fundamentals of Refrigeration and Electrical	16	
2nd Semester	HVA 1150	Mechanical Applications	9	HVA 1000
	HVA 1155	HVA Internship I	5	HVA 1150
3rd Semester	HVA 2010	Residential Heat/AC and Heat Pumps	9	HVA 1150
	HVA 2015	HVA Internship II	5	HVA 1150
4th Semester	HVA 2110	Commercial Refrigeration and Light Commercial Heat/AC	9	HVA 1150
	HVA 2115	HVA Internship III	5	HVA 1150
		Total Technical Credits	58	

HVACR Program Outcomes: *(No Change to Program Outcomes)*

- Diagnose malfunctions of air conditioning, heating and refrigeration equipment and repair, replace, or service to manufacturer and/or industry standards.
- Install and/or repair any supporting electrical and piping systems in which HVAC/R are dependent upon.

CHANGES COMPARED TO CURRENT PROGRAM:

- 1st and 2nd semester of old program is combined into first semester
 - Some course outcomes are moved to HVA 1150 Mechanical Applications

- Daily course session extended one hours (5 hrs)
- HVA 1150 Mechanical Applications is a new course
 - New course that incorporates natural gas components along with outcomes needed to start first internship (Piping, OSHA, etc.)
- HVA 2010 Residential Heat/AC & Heat Pumps and HVA 2110 Commercial Refrigeration and Light Commercial Heat/AC will contain same outcomes, but will now be paired with internships.

Course Times/Starts:

- 1st-4th Semester: 5 hrs/day, 5 days/week
- All students begin with HVA 1000.

HVA 1000 Fundamentals of Refrigeration and Electrical

This course introduces proper tool usage, refrigeration, lines, and component operation. Students learn the layout and fabrication of residential duct fittings. They will learn to read a temperature/pressure chart and apply it to various refrigerants which are used in the trade. Procedures such as recovery, evacuation, leak testing, and charging of refrigerant will be performed on various types of equipment to EPA standards. Students will be introduced to various types of metering devices, including gauge manifold and two-way service valves. Students will learn trouble diagnosis, charging methods, and the proper operation of a refrigerator and air conditioner, including proper pressures, temperatures, and running times. This course then continues with the introduction of basic electrical theory, Ohm's law, insulators, conductors, switches, and loads. Students will read and produce wiring/ladder diagrams, learn to wire and troubleshoot control circuits, motors, compressors, and relays. (16 credits)

HVA 1150 Mechanical Applications

This course involves learning how to use trade specific hand and power tools to OSHA 10 standards. Accurate trade measurements will be taken along with making leak-tight flare, swag, solder, and braze connections on copper tubing. Students will be introduced to the basic principles of natural gas along with pipe and vent-sizing of gas furnaces. Students will also learn the basics of pipe fusion and how to thread steel pipe together by using proper calculations and measurements. Nine credit hours.

HVA 2110 Commercial Refrigeration & Light Commercial Heat/AC

This course covers principles of commercial refrigeration and light commercial heat/air conditioning (AC) operation. Emphasis will be placed on the evaluation of the operational sequence of component parts for a variety of refrigeration systems, such as walk-in coolers, reach-in freezers, open display cases, beverage coolers, and a variety of three-phase commercial AC units and accessories. Students will monitor system operation, obtaining applicable performance conditions and diagnosis operation using EPA industry standards. Students will learn to troubleshoot electrical circuits, refrigeration circuits, water circuits, and air circuits for different refrigeration systems. Students will also systematically diagnosis a wide variety of commercial refrigeration and light air conditioning systems as well as correctly size components to select proper replacement parts following system analysis. The fundamentals of hydronics (heating or cooling by circulation of a fluid), steam heat and special controls, diagnosis, charging, and checkout procedure are covered as well. Building Automated Systems (BAS) used in the control and monitoring of facilities, energy use, and zone comfort conditions will be introduced. Nine credit hours

HVA 2010 Residential Heat/Air & Heat Pumps

This course covers the principles of wiring components and troubleshooting gas furnace systems including standing pilot, spark to pilot and direct ignition in two-stage and modulating gas systems. Indoor Air Quality Products (IAQ) including variable speed blower systems are taught. Students will also learn to troubleshoot electrical, refrigeration, and airflow of

residential air conditioning, electric heat, and heat pump equipment. Students perform all rough in, ductwork, and installation of new systems. Students will calculate duct sizing of sheet metal duct fittings for low pressure duct systems. Emphasis is placed on service skills and systematic diagnosis. Nine credit hours

HVA 1155/2015/2115 HVA Internship I/II/III

Students will participate in an employer-sponsored work study where they apply a variety of HVACR operations in a workplace setting. The work and equipment may vary by worksite and may be located indoors or outdoors. Five credit hours.

Major Appliance Technology

AT/AS/CTT

			Credits	Prerequisites
1st Semester	HVA 1000	Fundamentals of Refrigeration and Electrical	16	
2nd Semester	HVA 1150	Mechanical Applications	9	HVA 1000
	MAT 1155	MAT Internship I	5	HVA1150
	UMT 1155	UMT Internship I	5	HVA1150
3rd Semester	HVA 2010	Residential Heat/AC and Heat Pumps	9	HVA1150
	MAT 2015	MAT Internship II	5	HVA1150
	UMT 2015	UMT Internship II	5	HVA1150
4th Semester	MAT 2110	Major Appliance Technology	9	HVA1150
	MAT 2115	MAT Internship III	5	HVA1150
	UMT 2115	UMT Internship III	5	HVA1150
Total Technical Credits			58	

MAT Program Outcomes: *(No Change in Program Outcomes)*

- Diagnose malfunctions of dishwashers, washers, dryers, residential air conditioning, cooking, and heating equipment, and repair, replace, or service to manufacturer and/or industry standards.
- Install and/or repair any supporting electrical and mechanical systems which are dependent upon dishwashers, washers, dryers, residential air conditioning, cooking, and heating equipment.

Spire Apprenticeship Program students would be enrolled in this degree.

MAT 2110 Major Appliance Technology

This course includes the instruction and practical application of the repairs and service industry for electrical and gas appliances, such as washers, dryers, ranges, microwave ovens, refrigerators, and window air conditioners. Students learn the theory and application aspects, while working on real appliances and developing job skills in a workshop setting. Upon course completion, students will demonstrate a full knowledge of a variety of appliances and be able to diagnose and repair many in-home major appliances to become a productive worker as an entry-level service professional. Students use technology to develop fundamental

skills for tracing and completing electrical circuits for major appliances. The course also trains students how to effectively communicate and apply customer relation skills to be used in an in-home environment. Nine credit hours

MAT 1155/2015/2115 MAT Internship I/II/III

Students will participate in an employer-sponsored work study where they apply a variety of major appliance operations in a workplace setting. The work and equipment may vary by worksite and may be located indoors or outdoors. Five credit hours.

1. Maintain a professional appearance and attitude for employment.
2. Perform job tasks as an entry-level technician.
3. Follow proper safety guidelines in the industry.
4. Provide appropriate customer service in the utility or major appliance field.

UMT 1155/2015/2115 UMT Internship I/II/III

Students will participate in an employer-sponsored work study where they apply a variety of utility operations in a workplace setting. The work and equipment may vary by worksite and may be located indoors or outdoors. Five credit hours.

1. Maintain a professional appearance and attitude for employment.
2. Perform job tasks as an entry-level technician.
3. Follow proper safety guidelines in the industry.
4. Provide appropriate customer service in the utility or major appliance field.

HVAC Coding Summary chart with changes highlighted in yellow below.

Program: HVAC **Adding HVACR Daytime Program to PRY Eff FA23**
Program Division: Undergraduate Day (UD) **Program Division Category: Construction**

Current Program (Effective FA20 term, August 2020)							
Campus	CIP Code	Major Title	Concentration Title	Degree Codes	Tech Credits	Terms Required	Program Length
St. Louis	150501	Heating, Ventilation, and Air Conditioning Technology	Commercial Refrigeration	CT, AT, AS	52	4	64
			Major Appliance Technology	CT, AT, AS	52	4	64
			Utility Maintenance Technology	CT, AT, AS	73	5	80
New Program (Effective FA23 term, August 2023) [CT Degree Option Available SP23 (January 2024)]							
Campus	CIP Code	Major Title	Conc Title	Degree Codes	Tech Credits	Terms Required	Program Length
St. Louis	150501	Heating, Ventilation, Air Conditioning & Refrigeration Technology	None	CT, AT, AS	58	4	64
	470106	Major Appliance Technology	None	CT, AT, AS	58	4	64
	470106	Major Appliance Technology	None	CT, AT, AS	58	4	64
Perryville	150501	Heating, Ventilation, Air Conditioning & Refrigeration Technology	None	CT, AT, AS	58	4	64



MAJOR APPLIANCE TECHNOLOGY
DEGREE CHOICES: CT, AT, AS
CAMPUS: ST. LOUIS
2023-24 CURRICULUM GUIDE

	Hours	Prerequisites
1ST Semester		
HVA 1000 Fundamentals of Refrigeration and Electrical	16	
WEG HV10 Work Ethic Grade course	0	
General Education classes as needed per degree choice		
2nd Semester		
HVA 1150 Mechanical Applications	9	HVA 1000
Choose one:		
MAT 1155 MAT Internship I & WEG MA11	5	HVA 1150
UMT 1155 UMT Internship I & WEG UM11	5	HVA 1150
General Education classes as needed per degree choice		
3RD or 4TH Semester		
HVA 2010 Residential Heat/AC and Heat Pumps	9	HVA 1150
Choose one:		
MAT 2015 MAT Internship II & WEG MA20	5	HVA 1150
UMT 2015 UMT Internship II & WEG UM20	5	HVA 1150
General Education classes as needed per degree choice		
3RD or 4TH Semester		
MAT 2110 Major Appliance Technology	9	HVA1150
Choose one:		
MAT 2115 MAT Internship III & WEG MA21	5	HVA 1150
UMT 2115 UMT Internship III & WEG UM21	5	HVA 1150
General Education classes as needed per degree choice		

General Education Requirements	Hours	Certificate of Technology (CT)	Associate of Technology (AT)	Associate of Science (AS)	Prerequisite /Corequisite
Communications	3	COM 1080 Technical Communications	COM 1105 Oral Communications	COM 1105	
Business & Information Technology	3	BUS 1000 Career Success Skills	BUS 1000	BUS 1000	
	3		MNG 1204 Intro to Business & Mgmt	MNG 1204	ENG 1099 (coreq)
English	3		ENG 1099 Foundations of Composition	ENG 1099	
	3		ENG 1101 College Composition I	ENG 1101	ENG 1099
	3		ENG 2102 College Composition II	ENG 2102	ENG 1101
Social Sciences	3		SOC 1206 Principles of Sociology or PSY 1206 Introduction to Psychology	SOC 1206 or PSY 1206	ENG 1099 (coreq)
Mathematics & Science	3		MTH 1110 Elementary Algebra	MTH 1110	
	3		MTH 1111 Intermediate Algebra	MTH 1111	MTH 1110
	3			MTH 2112 College Algebra	MTH 1111
	3			MTH 2220 Trigonometry	MTH 2112
	3			PHY 2230 College Physics	MTH 2220
	3			MTH 2240 Survey of Calculus	MTH 2112

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Interoffice use only: Major = MAPLT; Concentration = none; major hours = 58; Degree Audit Code: MAPLT

Note: CTT Option Available SP23 [January 2024]



Heating, Ventilation, Air Conditioning And Refrigeration Technology
DEGREE CHOICES: CT, AT, AS
CAMPUS: ST. LOUIS AND PERRYVILLE
2023-24 CURRICULUM GUIDE

	Hours	Prerequisites
<u>1ST Semester</u>		
HVA 1000 Fundamentals of Refrigeration and Electrical	16	
WEG HV10 Work Ethic Grade course	0	
General Education classes as needed per degree choice		
<u>2ND Semester</u>		
HVA 1150 Mechanical Applications	9	HVA 1000
HVA 1155 HVA Internship I	5	HVA 1150
WEG HV11 Work Ethic Grade course	0	
General Education classes as needed per degree choice		
<u>3RD or 4TH Semester</u>		
HVA 2010 Residential Heat/AC and Heat Pumps	9	HVA 1150
HVA 2015 HVA Internship II	5	HVA 1150
WEG HV20 Work Ethic Grade course	0	
General Education classes as needed per degree choice		
<u>3RD or 4TH Semester</u>		
HVA 2110 Commercial Refrigeration and Light Commercial Heat/AC	9	HVA 1150
HVA 2115 HVA Internship III	5	HVA 1150
WEG HV21 Work Ethic Grade course	0	
General Education classes as needed per degree choice		

General Education Requirements	Hours	Certificate of Technology (CT)	Associate of Technology (AT)	Associate of Science (AS)	Prerequisite /Corequisite
Communications	3	COM 1080 Technical Communications	COM 1105 Oral Communications	COM 1105	
Business & Information Technology	3	BUS 1000 Career Success Skills	BUS 1000	BUS 1000	
	3		MNG 1204 Intro to Business & Mgmt	MNG 1204	ENG 1099 (coreq)
English	3		ENG 1099 Foundations of Composition	ENG 1099	
	3		ENG 1101 College Composition I	ENG 1101	ENG 1099
	3		ENG 2102 College Composition II	ENG 2102	ENG 1101
Social Sciences	3		SOC 1206 Principles of Sociology or PSY 1206 Introduction to Psychology	SOC 1206 or PSY 1206	ENG 1099 (coreq)
Mathematics & Science	3		MTH 1110 Elementary Algebra	MTH 1110	
	3		MTH 1111 Intermediate Algebra	MTH 1111	MTH 1110
	3			MTH 2112 College Algebra	MTH 1111
	3			MTH 2220 Trigonometry	MTH 2112
	3			PHY 2230 College Physics	MTH 2220
	3			MTH 2240 Survey of Calculus	MTH 2112

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Interoffice use only: Major = HVACR; Concentration = none; major hours = 58; Degree Audit Code: HVACR

Note: CTT Option Available SP23 [January 2024]