

MAJOR APPLIANCE TECHNOLOGY

ST. LOUIS

Home appliances play an essential role in the daily routine of the average American household. Accordingly, there has been a rise in the quantity and variety of household appliances in today's market. Because many of these are complex appliances, a greater degree of knowledge is required to diagnose and service the systems efficiently. Students enrolled in the Major Appliance Technology program receive hands-on experience troubleshooting and repairing gas and electric components for household appliances.

ASSOCIATE OF TECHNOLOGY, ASSOCIATE OF SCIENCE OR CERTIFICATE OF TECHNOLOGY

In this full-time, four-semester program, students receive instruction in:

- Basic refrigeration and electricity theories
- Applied electrical circuits
- Domestic equipment
- Electromechanical knowledge and skills to diagnose and correct appliance difficulties

Graduates will be able to install and service equipment in the refrigeration, heating, air conditioning and appliance repair industries. Students will participate in three internships where students will be able to practice their new skills in a real world work environment. Students interested in completing the certificate of technology program will take all technical courses in the associate degree program, but will only need to complete two general education courses.

Students who obtain a Major Appliance Technology associate degree can choose to receive more in-depth training in Heating, Ventilation, Air Conditioning and Refrigeration (HVACR) by taking one extra semester of courses in this program. Upon completion of the extra semester, students enrolled in an associate degree program will receive an associate degree in both Major Appliance Technology and HVACR, while students pursuing a certificate program will receive a certificate for Major Appliance Technology and HVACR.

Upon completion of the program, students will be able to:

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

DAY PROGRAM COURSES			HOURS	PREREQUISITES
First Semester	HVA1000	Fundamentals of Refrigeration and Electrical	16	
Second Semester	HVA1150	Mechanical Application	9	HVA1000
	HVA1155	HVA Internship I	5	HVA1150
Third or Fourth Semester	HVA2010	Residential Heat/AC and Heat Pumps OR	9	HVA1150
	HVA2110	Commercial Refrigeration and Light Commercial Heat/AC	9	HVA1150
	HVA2015	HVA Internship II	5	HVA1150
Third or Fourth Semester	MAT2110	Major Appliance Technology	9	HVA1150
	MAT2115	MAT Internship III	5	HVA1150
<i>Total Technical Credit Hours Required</i>			<i>58</i>	

GENERAL EDUCATION COURSES			HOURS	PREREQUISITES
English/Social Sciences	ENG1101	College Composition I	3	ENG1099
	ENG2102	College Composition II	3	ENG1101
	COM1105	Oral Communications	3	
	SOC1206	Principles of Sociology or	3	ENG1099 (Co. Req.)
	PSY1206	Introduction to Psychology	3	ENG1099 (Co. Req.)
Mathematics/Science	MTH1110	Elementary Algebra	3	
	MTH1111	Intermediate Algebra	3	MTH1110
Business/Information Technology	BUS1000	Career Success Skills	3	
	MNG1204	Intro to Business & Management	3	ENG1099 (Co. Req.)
Associate of Science	MTH2112	College Algebra	3	MTH1111
Additional Required	MTH2220	Trigonometry	3	MTH2112

Courses	PHY2230	College Physics	3	MTH2220
	MTH2240	Survey of Calculus	3	MTH2112
GENERAL EDUCATION COURSES (CERTIFICATE OF TECHNOLOGY)			HOURS	PREREQUISITES
	COM1080	Technical Communications	3	
	BUS1000	Career Success Skills	3	

Important Note: Only courses in which a grade of "C" or higher is earned may be applied toward this Ranken degree.

COURSE DESCRIPTIONS

HVA1000 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. *Sixteen credit hours*

HVA1150 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*

HVA2010 Residential Heat/AC and 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*

HVA2110 Commercial Refrigeration and 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*

MAT2110 Major Appliances 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*

HVA1155/2015/MAT2115 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