



CONSTRUCTION DIVISION

ARCHITECTURAL TECHNOLOGY

Combining critical thinking skills, state-of-the-art technology and hands-on experience, the Architectural Technology program trains students in the newest practices of this evolving profession. The program is designed to provide students with the knowledge, understanding and skills to not only launch successful careers, but also fully participate in the practice of architecture. Upon completion of the program, students will be able to assess, plan and create effective building and structural design. Student coursework centers on hands-on architectural projects. Course offerings include in-depth design and construction principles, site, structural and building environment engineering, building information modeling and internet and digital imaging tools.

Hands-on experience is an integral component to student success in the Architectural Technology program. Students have participated in several real-world projects as well as gaining exposure to construction sites. A series of studio classes, taken throughout the program and steadily increasing in complexity, allows students to work together on their projects in a mentoring atmosphere. This reflects the real-world practice of partnering junior and senior architects on projects, helping them to develop their own skills and their ability to mentor others.

PROGRAM OBJECTIVES

- Problem Solving/Critical Thinking
- Architectural Awareness
- Professionalism
- Fundamentals of Building Technology
- Fundamentals of Graphic Communication

BACHELOR OF SCIENCE IN ARCHITECTURAL TECHNOLOGY

Providing thorough training and experience in all aspects of the architectural profession, course offerings include design principles, site and building design, construction technology, structural principles, architectural history, building information modeling and computer modeling.

Throughout the program, students participate in a series of architectural studio classes that combine design projects with studio work and offer students the opportunity to manage projects from concept design through construction documentation. Students complete major studio projects in the following areas:

- Residential building technology using AutoCAD®
- Commercial building technology using AutoCAD® and Revit® Architecture
- Building design using 2D and 3D computer modeling
- Building design using Revit® Architecture
- Architectural visualization using Revit® Architecture and 3ds Max® Design

Students enrolled in the Architectural Technology program are required to complete the majority of their coursework via computer, utilizing computer-aided design and drafting in each of their studio projects. Mirroring current industry practices, the program provides training in AutoCAD®, Autodesk® 3ds Max Design and Revit® Architecture, as well as a breadth of other graphics software. At the beginning of their first semester, students lease a notebook computer for use during their academic career at Ranken Technical College, with a buyout option upon completion of the program.

ASSOCIATE OF SCIENCE OR ASSOCIATE OF TECHNOLOGY IN ARCHITECTURAL TECHNOLOGY

For students who wish to complete only two years of introductory architectural technology and drafting training, the program offers the option to pursue either an associate of science or associate of technology degree option. After completion, the student will be qualified for employment as an architectural draftsman. A student completing one of these degrees will not be able to pursue the bachelor's degree without taking additional general education and technical courses first.

DAY PROGRAM COURSES			HOURS	PREREQUISITES
First Semester	ART1113	Architectural Graphics and Intro to AutoCAD®	6	ART1125, MTH1110 (Co. Req.)
	ART1125	Materials and Methods I	3	ART1113 (Co. Req.)
Second Semester	ART1225	Material and Methods II	3	ART1125
	ART2120	Architectural Technology Studio I	6	ART1113
	ART2221	Architectural History I	3	ENG1101
Third Semester	ART2220	Architectural Technology Studio II	6	ART2120
	ART3123	Intro to BIM	3	ART2120
Fourth Semester	ART1224	Principles of Design	6	ART1113
	ART2121	Structures I (Not required for Associate of Technology)	2	MTH2122
	ART2123	Building Systems Design	3	MTH1110
Fifth Semester	ART2222	Structures II	2	ART2121
	ART3113	3D Modeling and Graphic Presentation	3	ART2220
	ART3120	Architectural Technology Studio III	6	ART2220, ART3123
Sixth Semester	ART3222	Site Design and Engineering	3	ART2220, MTH2220 (Co. Req.)
	ART3220	Junior Architectural Studio	7	ART2220
	ART3221	Architectural History II	3	ART2221
Seventh Semester	FNA3004	Digital Graphics for Architecture	3	ART3113
	ART4112	Professional Practice	3	ENG2102
	ART4120	Senior Architectural Studio I—Design	7	ART3113
	SOC4100	Survey of Research Methods	3	
	ART	Architectural Elective	3	
Eighth Semester	ART	Internship or Elective	3	All ART2200 level courses
	ART4202	Capstone Portfolio	1	
	ART4203	Capstone Research Project	2	SOC4100
	ART4220	Senior Architectural Studio II—Design	7	ART3113
Electives (Two Required)	ART3024	Principles of LEED	3	
	ART4200	Architectural Internship	3	
	ART3022	Interior Design	3	
	CRP0110	Exterior/Interior Frame Construction (Evening course)	3	
	CRP0120	Interior Finish (Evening course)	3	
<i>Total Technical Credit Hours Required</i>			97	

GENERAL EDUCATION COURSES			HOURS	PREREQUISITES
English/Social Sciences	ENG1101	College Composition I	3	Placement Exam or 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 and MTH1111 Intermediate Algebra or	6	Placement Exam or MTH1099
	MTH1100	Elementary/Intermediate Algebra	3	Placement Exam
Business/Information Technology	BUS1000	Career Success Skills	3	
	MNG1204	Intro to Business & Management	3	ENG1099 (Co. Req.)
Bachelor's and Associate of Science Additional Required Courses	COM3000	Intercultural Communications or	3	(Required for Bachelor of Science in Architectural Technology only)
	COM3100	Organizational Communications	3	
	MTH2112	College Algebra	3	MTH1100 or MTH1111
	MTH2220	Trigonometry	3	MTH2112
	MTH2240	Survey of Calculus	3	MTH2112
	PHY2230	College Physics	3	MTH2112
	ETH3000	Contemporary Ethics or	3	(Required for Bachelor of Science in Architectural Technology only)
	PSY3100	Organizational Behavior or	3	
PSY4000	Organizational Psychology	3		

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

COURSE DESCRIPTIONS

ART1113 Architectural Graphics and Intro to AutoCAD®

A combination lecture/studio course that includes an introduction to basic architectural graphics. The course develops basic skills for constructing architectural drawings representing two and three dimensions using proper drafting methods with AutoCAD®. The students will develop basic drafting vocabulary, sketching and architectural drawing skills and comprehend the role of the architect. *Six credit hours.*

ART1125 Materials and Methods I

Materials and Methods I is a course designed to give a student the vocabulary skills necessary to understand and design structures using standard building materials and methods. Characteristics of these materials and the principal factors affecting residential and small commercial structures are covered. Particular consideration is given to foundation, floor, wall and roof construction, project phases and sustainability. *Three credit hours.*

ART1224 Principles of Design

A lecture/studio designed for students to develop a fundamental understanding of the primary components of design. The course has three parts: aesthetic theory, abstract graphics and design vignettes. The vignettes are designed to give the students an architectural inquiry on the broad range of topics discussed. Specific studio emphasis is given to the basic consideration of beauty, form, space, order and light, as well as the implications of function, use of materials and design intent. Numerous successful architectural works are examined and discussed. *Six credit hours.*

ART1225 Material and Methods II

Materials and Methods II is a lecture course designed to give students the skills necessary to understand the material used in commercial building and the details necessary to construct such buildings. Through discussion and given examples, the student will use problem-solving skills to create details using AutoCAD®. *Three credit hours.*

ART2120 Architectural Technology Studio I

Architectural Technology Studio I is a studio course that directs the student to produce construction documents for residential projects. From given designs, the student will create floor plans and elevations for a small project and plans, elevations and details for a larger project. During these tasks, the student will also be advancing their computer aided drafting skills with AutoCAD®. Lectures will integrate issues related to residential design, design styles, green building methods and other architectural topics. Miscellaneous projects will include a study model, color rendering and sketching assignments. *Six credit hours.*

ART2121 Structures I

The Structures I course is an introduction to structural engineering and related terminology as it applies to architecture. The course involves calculating direct stress problems, reactions for beams, properties of sections, shear diagrams and moment diagrams. Students will become familiar with using structural tables to solve

related formulas. *Two credit hours.*

ART2123 Building Systems Design

This course is designed to familiarize the student with the basic components of mechanical, electrical and plumbing systems, as well as to develop and understand how building materials and site conditions impact the design of those systems. The intent is that the student is then capable of making design choices which facilitate a more energy efficient and sustainable structure. Students will be expected to become fluent in the terms used by mechanical, plumbing, lighting and electrical design professionals and understand the concepts of calculating the basic building systems loads. *Three credit hours.*

ART2220 Architectural Technology Studio II

This course introduces the student to commercial building projects. The student will be given a small commercial building design and the necessary criteria to develop the interior spaces, as well as the site conditions. The student will create required plans, sections, details and schedules to be compiled into a set of construction documents. Through weekly lectures, the student will investigate commercial building techniques, building codes and Americans with Disabilities Act (ADA) regulations. *Six credit hours.*

ART2221 Architectural History I

Students learn contextual architectural history surrounding the discipline. Coursework is developed for students to understand the culture of the western world and how it created the architecture of the Ancient through Medieval eras. Students will be exposed to many different built structures and city planning examples through slide shows, lectures and class discussions. *Three credit hours.*

ART2222 Structures II

The Structures II course is designed to build upon the previous Structures I course. This course combines the design aspects of wood, steel and concrete structural materials. Students will design beams, columns, plates and slabs; and investigate other design considerations including shear, deflection and bearing. With given information, students will design for these members using formulas and appropriate tables. *Two credit hours.*

ART3022 Interior Design

Interior Design is an architectural elective course with the intent to provide the student with a comprehensive knowledge of the practices and concepts of interior design. In addition to lectures on materials, color, lighting, furniture, space planning and more, the student will create related projects and present them to the class in a critique setting. These projects

will require the students to utilize skills in sketching, CAD, rendering, design and communication. *Three credit hours.*

ART3024 Principles of LEED

Principles of LEED will introduce and explore the issues and concepts surrounding sustainable design and green building methods as prescribed by the LEED program. After reviewing the history and influencers of man's relationship to nature through the built environment, we will discuss the LEED rating system and certification process as well as other assessment systems.

Topics will include the integration of sustainability with building systems for new construction and other types of projects, as well as the economics of green building and current initiatives. *Three credit hours.*

ART3113 3D Modeling and Graphic Presentation

The course will deal with architectural applications of computer-aided drafting involving 3D mass modeling, parametric solid modeling, rendering and animations. Students learn software typically used in the architectural profession such as AutoCAD®, Revit® Architecture, Autodesk® 3ds Max Design and Image Editing programs. A basic introduction to the systems will be presented. This course is a combined lecture/studio that will reinforce commands learned by performing related exercises and projects. *Three credit hours.*

ART3120 Architectural Technology Studio III

As a student advances in their architectural education, it is important that all stages of the development of a design project are synthesized to the extent that is reasonably completed in an academic setting. The goal of this studio is to have the student carry the project through the latter stages of the design process culminating in a representative set of documents from which the conceived project could be built. The student will learn to use Revit® Architecture, AIA Masterspec® and Microsoft Excel software to develop the final documents. *Six credit hours.*

ART3123 Intro to BIM

This course will introduce students to the concepts and applications of Building Information Modeling (BIM). The student will become familiar with the advantages of BIM and the variety of uses within the building design industry. Students will learn the essentials to create an intelligent computer model of a building project using the latest computer modeling software. *Three credit hours.*

ART3220 Junior Architectural Studio

The studio is designed to focus on developing the student's basic architectural design and technical skills while utilizing various computer applications in the design solution process. Architectural design problems are given for the student to solve. Meaningful case studies will be examined relative to the specific architectural problems given. Not only advanced computer applications will be utilized, but the student will also use and develop traditional media of sketches and physical models to represent their design concepts and solutions. Emphasis will be placed on developing not only technical and functional credibility in the design solutions, but also on learning correct design presentation methods. *Seven credit hours.*

ART3221 Architectural History II

This course is a continuation from ART2221 Architectural History I and is designed to expose the students to western architecture, design and city planning from the Renaissance to the present day. The content of this course is delivered through slide shows and class discussions. *Three credit hours.*

ART3222 Site Design and Engineering

This course is a lecture and studio class, which includes site planning, building site orientation, site circulation,

site security, grading, utilities, hydraulics and landscaping. *Three credit hours.*

ART4112 Professional Practice

Professional Practice is a lecture designed to educate the student on the inherent responsibilities of managing a construction project and the communications required for the success of the project. Topics include: project construction management, contracts, project administration and specifying products. Projects include: preparing RFP, CCD, CCR and addendums, constructing cost estimates and scheduling charts, composing letters and memos to clients will also be required. This course reserves time to be spent on discussing work ethic and its role in project management. *Three credit hours.*

ART4120 Senior Architectural Studio I—Design

The studio is designed to focus on developing the student's basic architectural design and technical skills while utilizing various computer applications in the design solution process. Architectural design problems are given for the student to solve. Meaningful case studies will be examined relative to the specific architectural problems given. Not only advanced computer applications will be utilized, but the student will also use and develop traditional media of sketches and physical models to represent their design concepts and solutions. Emphasis will be placed on developing not only technical and functional credibility in the design solutions but also on learning correct design presentation methods. *Seven credit hours.*

ART4200 Architectural Internship

The purpose of the internship program is to allow the student to synthesize their assembled body of knowledge in a real work environment by allowing them to participate in the daily operations of a firm and perform duties similar to those that they would perform if employed in the prescribed role. Eligible students from the Architectural Technology Department can combine a working and learning experience for credit in architectural firms, engineering offices or consulting engineering firms. *Three credit hours.*

ART4202 Capstone Portfolio

The Capstone Portfolio is designed to facilitate the assembly of selected examples of the student's work into a concise, carefully executed document. The document serves to clearly represent the student's competencies and skills to the AEC community, while seeking employment in the industry. *One credit hour.*

ART4203 Capstone Research Project

The research project is a culminating activity involving an interdisciplinary approach, synthesizing prior learning and presented using written, research and oral components. The purpose of the research project is to provide the student with a practical learning situation and an invaluable opportunity to utilize the knowledge and skills acquired over the course of the education process in a "real-world" application of the students' abilities. *Two credit hours.*

ART4220 Senior Architectural Studio II—Design

The studio is designed to focus on developing the student's

basic architectural design and technical skills while utilizing various computer applications in the design solution process. Architectural design problems are given for the student to solve. Meaningful case studies will be examined relative to the specific architectural problems given. Not only advanced computer applications will be utilized, but the student will also use and develop traditional media of sketches and physical models to represent their design concepts and solutions. Emphasis will be placed on developing not only technical and functional credibility in the design solutions but also on learning correct design presentation methods. *Seven credit hours.*

FNA3004 Digital Graphics for Architecture

Provides graphic design strategies as a medium for visualization in architectural presentation. Students learn current software and techniques that are practical for architectural graphics and diagrams such as Photoshop, Adobe Illustrator and InDesign. Students will design and produce final board presentations and portfolio layout for school and/or professional applications through lectures, digital workshops, and studio related exercises. *Three credit hours.*

BUILDING SYSTEMS ENGINEERING TECHNOLOGY WENTZVILLE

Building systems engineering technicians collaborate with engineers in systems design, applications, testing and development work. Those who work with mechanical contractors perform design, equipment selection, layouts, estimating and the supervision of building systems. Ranken's Building Systems Engineering Technology program will provide individuals with the skills, knowledge and experience needed to successfully acquire a design position and advance in their chosen field.

ASSOCIATE OF TECHNOLOGY OR ASSOCIATE OF SCIENCE

Ranken's Building Systems Engineering Technology program provides instruction in a wide range of overall system design, as well as in the selection and application of mechanical, electrical and piping equipment. Students use mechanical engineering principles to produce working drawings of electrical, heating, ventilation and air conditioning, as well

as plumbing and fire protection systems for large scale commercial buildings.

Also included are analyzing prints, using spreadsheets for cost estimating, preparing 3D scale and computer aided design (CAD) models and mechanical/electrical/plumbing (MEP) plans for heating, ventilation and air conditioning (HVAC), electrical and plumbing using AutoCAD® and Autodesk® Revit® MEP software.

DAY PROGRAM COURSES			HOURS	PREREQUISITES
First Semester	BSE1000	Building Systems	12	
Second, Third or Fourth Semester	BSE1100	Heating Ventilation Air Conditioning/Mechanical Systems	12	BSE1000
Second, Third or Fourth Semester	BSE2000	Electrical Systems	12	BSE1000
Second, Third or Fourth Semester	BSE2010	Piping and Fire Protection	12	BSE1000
<i>Total Technical Credit Hours Required</i>			<i>48</i>	

GENERAL EDUCATION COURSES			HOURS	PREREQUISITES
English/Social Sciences	ENG1101	College Composition I	3	Placement Exam or 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 and MTH1111 Intermediate Algebra or	6	Placement Exam or MTH1099
	MTH1100	Elementary/Intermediate Algebra	3	Placement Exam
Business/Information Technology	BUS1000	Career Success Skills	3	
	MNG1204	Intro to Business & Management	3	ENG1099 (Co. Req.)
Associate of Science	MTH2112	College Algebra	3	MTH1100 or MTH1111
Additional Required Courses	MTH2220	Trigonometry	3	MTH2112
	PHY2230	College Physics	3	MTH2220
	MTH2240	Survey of Calculus	3	MTH2112

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

COURSE DESCRIPTIONS

BSE1000 Building Systems

This course provides a comprehensive overview of architectural building planning and design. The student will work with Computer Aided Design (CAD) and Building Information Modeling (BIM) software including AutoCAD and Autodesk Revit MEP. Focus on the theory and practice of building design with emphasis on code requirements, specifications, and material selections will be presented. Students will learn print reading,

how to utilize Architectural, Engineering and Metric scales along with their associated scale factors. The construction management process and proper CAD file management techniques will be introduced. *Twelve credit hours.*

BSE1100 Heating Ventilation Air Conditioning/Mechanical Systems

This course provides a comprehensive overview of heating ventilation air conditioning and mechanical building systems. The student will work with Computer Aided Design (CAD) and

Building Information Management (BIM) software including AutoCAD, Revit MEP, and Navisworks Manage. Focus on the theory and practice of mechanical building system design with emphasis on code requirements, specifications, load, heat loss and heat gain calculation procedures will be presented. Students will learn about various air distribution systems, hydronic, steam and refrigeration design techniques along with the construction management process that accompanies their installation.

Twelve credit hours.

BSE2000 Electrical Systems

This course provides a comprehensive overview of electrical distribution systems within the built environment. The student will work with Computer Aided Design (CAD) and Building Information Modeling (BIM) software including AutoCAD and Autodesk Revit. Focus on the theory and practice of electrical building system design with emphasis on National Electric Code (NEC) requirements and specifications will be presented. Students will learn about various lighting design and estimation concepts along with the construction management process that accompanies their installation, use and maintenance. *Twelve credit hours.*

BSE2010 Piping and Fire Protection

This course provides a comprehensive overview of piping and fire protection systems. The student will work with Computer Aided Design (CAD) and Building Information Modeling (BIM) software including AutoCAD and Autodesk Revit. Focus on the theory and practice of piping design and fire suppression systems with emphasis on Uniform Plumbing Code requirements and specifications will be presented. Students will learn about various types of piping and fire suppression systems and estimation concepts along with the construction management process that accompanies their installation.

Twelve credit hours.

CARPENTRY AND BUILDING CONSTRUCTION TECHNOLOGY

Ranken's Carpentry and Building Construction Technology program provides students with instruction and experience in residential building construction. Practical application and experience are an integral part of the carpentry program, providing students with real, hands-on training and unmatched skill development. Emphasizing leading practices in carpentry today, these programs prepare students for all phases of residential building construction. The carpentry program also prepares students to hold a job in the field by providing instruction about blueprint reading and estimating. Graduates of Ranken's carpentry programs are qualified for employment with both unions and non-union building contractors specializing in new construction, home remodeling or in industry maintenance departments.

ASSOCIATE OF TECHNOLOGY, ASSOCIATE OF SCIENCE OR CERTIFICATE OF TECHNOLOGY

Throughout the Carpentry and Building Construction Technology program, students construct a residential structure from the ground up, in a series of phases, learning to:

- Manipulate hand and power tools, as well as stationary machinery
- Select lumber and building materials
- Complete residential buildings in all stages: foundation, frame, roof, interior and exterior finishing
- Read and interpret residential blueprints, shop drawings and building codes

As a required part of the program's curriculum, students participate in Ranken's Community Development Corporation (RCDC), a non-profit organization that constructs affordable homes for residents of the College's community. Students interested in completing the certificate of technology program will take all technical courses in the associate degree program and two general education courses.

DAY PROGRAM COURSES			HOURS	PREREQUISITES
First Semester	CRP1110	Residential Blueprint Reading	2	
	CRP1111	Framing and Formwork Theory	3	
	CRP1112	Framing and Formwork Shop	8	
Second Semester	CRP1210	Construction Estimating and Management	2	All CRP1100 Courses
	CRP1211	Interior and Exterior Finishes Theory	3	All CRP1100 Courses
	CRP1212	Interior and Exterior Finishes Shop	8	All CRP1100 Courses
Third Semester	CRP2101	Residential Housing Construction I	12	All CRP1200 Courses
Fourth Semester	CRP2201	Residential Housing Construction II	12	CRP2101
	CRP2202	Welding for Carpenters	2	CRP2101
<i>Total Technical Credit Hours Required</i>			<i>52</i>	

GENERAL EDUCATION COURSES			HOURS	PREREQUISITES
English/Social Sciences	ENG1101	College Composition I	3	Placement Exam or 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 and MTH1111 Intermediate Algebra or	6	Placement Exam or MTH1099
	MTH1100	Elementary/Intermediate Algebra	3	Placement Exam
Business/Information Technology	BUS1000	Career Success Skills	3	
	MNG1204	Intro to Business & Management	3	ENG1099 (Co. Req.)
Associate of Science Additional Required Courses	MTH2112	College Algebra	3	MTH1100 or MTH1111
	MTH2220	Trigonometry	3	MTH2112
	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

CRP1110 Residential Blueprint Reading

This course provides a thorough explanation of the term "blueprint" and the role of an architect in print production. The primary emphasis in this course is finding information and working with dimensions on a full set of residential drawings. Different types of views and drawings, symbols, abbreviations, specifications and details are covered in this course. In addition, students will learn basic trade math and sketching skills. *Two credit hours.*

CRP1111 Framing and Formwork Theory

This course supplements the CRP1112 shop class. The main topics covered in this course are light commercial and residential framing components and techniques. However, students will first learn basic hand and portable power tool identification and usage. The nature of wood and how it is applied in the construction industry will also be covered. Students will learn concrete formwork components and basic installation techniques as well as door and window installation. This course will also cover the theory of floor, wall, ceiling, roof and stair construction. *Three credit hours.*

CRP1112 Framing and Formwork Shop

This course will apply the theory taught in CRP1111 in a hands-on shop setting. The primary emphasis in this course is module construction, which involves the construction of floor, wall, ceiling, roof and stair frames. As in the theory course, Occupational Safety and Health Administration (OSHA) 10 safety training and basic hand and power tool identification and usage will be covered first. The components of a residential structure will be broken down into separate components and built in both individual and group settings. Students will build a step stool and/or chest, install Symons forms and lay out building lines. Students will also hang exterior doors and new-construction windows upon completion of the modules. *Eight credit hours.*

CRP1210 Construction Estimating and Management

This course introduces material estimation for concrete footings, foundations and flatwork. Students will learn how to estimate framing material for residential floors, walls and roofs. Using the Microsoft Office Excel program, students will prepare complete material takeoffs to submit to material vendors. Material and labor quantities, price per unit and total costs will be figured for each area of a residential structure. *Two credit hours.*

CRP1211 Interior and Exterior Finishes Theory

This course supplements the CRP1212 shop class. This course is primarily focused on interior/exterior finishes, which include base trim, window and door trim, crown molding, floor installation, interior door installation, roof shingles, vinyl siding, soffit and fascia. Students will learn about hand and portable power tool identification and usage, as well as basic components and installation techniques for the exterior/interior finishes in a residential structure. *Three credit hours.*

CRP1212 Interior and Exterior Finishes Shop

This course will apply the theory taught in CRP1211 in a hands-on shop setting. This course is primarily focused on interior/exterior finishes, which include installing base trim, window trim and crown molding, as well as various types of floor covering installation and interior door installation. On the exterior, students will install asphalt roof shingles, vinyl siding, soffit and fascia. This course also covers OSHA 10 safety training and basic hand and power tool identification and usage. Exterior and interior finishes will be installed by students on a residential module. *Eight credit hours.*

CRP2101 Residential Housing Construction I

This course provides a hands-on opportunity to complete all of the rough framing work in a residential structure. Students will use leveling instruments to install sill plates. Students will then construct the floor and wall frames out of engineered framing lumber and nominal framing lumber. The truss-setting procedure

will be covered in the course, along with all of the applicable safety guidelines. Students will install exterior doors and windows, coffered ceilings, vinyl siding, soffit and fascia. mortarless brick installation will also be introduced in this course. Time permitting, students will install all drywall sheet-goods on the interior of the structure. All students will also be involved in foreman development training. *Twelve credit hours.*

CRP2201 Residential Housing Construction II

This course provides hands-on opportunities to complete all of the finish work in a residential structure. Students hang and finish drywall and install interior doors. Base trim, window trim, and crown mold installation is the primary emphasis in this course. Students also frame the beams for a front porch, set the finished porch posts and install the soffit on the underside of the porch. Time permitting, students will set up all of the exterior flatwork forms and also lay out, install and pour the concrete in all footing

and foundation forms for the next year's program. All students will be involved in foreman development training. *Twelve credit hours.*

CRP2202 Welding for Carpenters

Students will learn basic welding and burning techniques used in the residential and commercial sector of the construction industry. The main emphasis in this course is Shielded Metal Arc Welding (SMAW/Stick Welding). Students will also learn how to weld on mild steel plates in horizontal and flat positions. In addition to SMAW, students will use oxy-fuel cutting to burn small holes and straight lines in mild steel. The final project in this course involves cutting and burning mild steel parts and welding them back together in accordance with industry and instructor specifications for strength and appearance. *Two credit hours.*

EVENING PROGRAM CERTIFICATE IN CARPENTRY MAINTENANCE

With a curriculum that combines classroom instruction and shop activities, this residential carpentry and maintenance program is designed for individuals who want to pursue a career in the carpentry maintenance field. Upon completion of the program, students will be able to:

- Compute basic construction math
- Frame a floor, wall and roof
- Install windows and doors
- Build basic stairs
- Construct concrete forms
- Perform Shielded Metal Arc Welding

These classes meet on Monday and Wednesday or Tuesday and Thursday evenings.

For students interested in furthering their education, these courses are creditable toward our Bachelor of Science in Applied Management (BSAM) degree.

EVENING PROGRAM COURSES			HOURS	PREREQUISITES
CRP0110	Exterior/Interior Frame Construction		6	
CRP0120	Interior Finish		6	
FWL0110	Welding I		6	
<i>Total Technical Credit Hours for Certificate Completion</i>			<i>18</i>	

COURSE DESCRIPTIONS

CRP0110 Exterior/Interior Frame Construction

This course covers basic carpentry math calculations of fractions and decimals as well as right-angle geometry. Students will learn how to identify and safely operate different hand and portable/stationary power tools. The course also covers how to set up and operate leveling instruments. Concrete formwork, floor and wall framing and gable roof construction are covered in this course. Upon completion of the basic framework of the small-scale module of the residential structure, students will hang an exterior door and install vinyl siding, soffit and fascia on

the exterior of the building. Students will install roof shingles and learn proper flashing and water prevention techniques. *Six credit hours.*

CRP0120 Interior Finish

This course covers the different aspects of interior finish work to be completed on the module constructed during CRP0110. Mathematical stair calculations and layout, as well as basic stair construction, is covered in this course. Residential drywall installation/patchwork and drywall finishing is covered. In this course, students will learn how to install different floor systems such as carpet, sheet vinyl, ceramic tile and laminate.

They will also learn how to install a suspended ceiling. Upon completion of the ceiling and flooring, students will install an interior pre-hung door unit and finish the rest of the structure with base trim and window casing. The basic woodworking portion of this course will cover the fabrication of small woodworking projects, such as a bookcase or coat rack. *Six credit hours.*

FWL0110 Welding I

Students will learn the necessary skills for welding and cutting processes used in the welding and fabrication industry. Processes covered in this program include Shield Metal Arc Welding (SMAW/Stick), GMAW (MiG) and GTAW (TiG) in the flat, horizontal and vertical positions. Lay-out, Oxy-Fuel cutting are also included in the curriculum. *Six credit hours.*

HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION TECHNOLOGY

In homes, offices, factories and schools, the air conditioning and heating industries provide year-round temperature, humidity and air quality control options, improving global standards of living. According to the US Bureau of Labor Statistics, employment of heating, air conditioning and refrigeration mechanics and installers is expected to grow 34 percent by the year 2020, which is much faster than the average growth rate for all occupations. Rising demand for trained technicians will result in excellent employment opportunities.

Students enrolled in the Heating, Ventilation, Air Conditioning and Refrigeration (HVACR) Technology program receive hands-on, practical experience in troubleshooting and repairing residential and commercial refrigeration, air conditioning and heating equipment. Students are trained on up-to-date technology and equipment to ensure superior knowledge in the HVACR industry.

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
- Sheet metal, piping and conduit bending
- Domestic equipment
- Refrigeration coolers and freezers
- Residential and commercial equipment
- Commercial ice-making equipment

Graduates are prepared for employment as HVACR mechanics, with the option to work in general service or specialize in a

particular field, such as residential air conditioning, commercial refrigeration or heating equipment. Graduates also work in maintenance at industrial plants, hotels, hospitals and apartment complexes that utilize large refrigeration, air conditioning and heating systems. 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 an HVACR associate degree or certificate can choose to receive more in-depth training in Major Appliance Technology 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..

DAY PROGRAM COURSES			HOURS	PREREQUISITES
First or Second Semester	HVA1011	Fundamentals of Heat Transfer and Domestic Applications Theory	5	
	HVA1012	Fundamentals of Heat Transfer and Domestic Applications Shop	8	
First or Second Semester	HVA1001	Electrical for HVACR Theory	5	
	HVA1002	Electrical for HVACR Shop	8	
Third or Fourth Semester	HVA2111	Commercial Refrigeration and Light Commercial Heat/AC Theory	5	All 1000 level courses
	HVA2112	Commercial Refrigeration and Light Commercial Heat/AC Shop	8	All 1000 level courses
Third or Fourth Semester	HVA2211	Residential Heat/Air and Commercial Ice Makers Theory	5	All 1000 level courses
	HVA2212	Residential Heat/Air and Commercial Ice Makers Shop	8	All 1000 level courses
<i>Total Technical Credit Hours Required</i>			52	

GENERAL EDUCATION COURSES			HOURS	PREREQUISITES
English/Social Sciences	ENG1101	College Composition I	3	Placement Exam or 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 and MTH1111 Intermediate Algebra or	6	Placement Exam or MTH1099
	MTH1100	Elementary/Intermediate Algebra	3	Placement Exam
Business/Information Technology	BUS1000	Career Success Skills	3	
	MNG1204	Intro to Business & Management	3	ENG1099 (Co. Req.)
Associate of Science Additional Required Courses	MTH2112	College Algebra	3	MTH1100 or MTH1111
	MTH2220	Trigonometry	3	MTH2112
	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

HVA1011 Fundamentals of Heat Transfer and Domestic Applications Theory

This course introduces the basics of refrigeration, including a description of what is taking place in each component and the lines connecting them. Students learn to read a temperature/pressure chart and apply it to various refrigerants which are used in the trade. Common service procedures such as gauge installation, evacuation and recovery of refrigeration are also covered in this course. Students are exposed to trade measurements and are given theory behind what it takes to make a good solder and braze connection on copper tubing. This course introduces students to pressures, temperatures and running times for refrigerators and room air conditioners and continues with charging, service and operation of domestic refrigerators and room air conditioners. Principles of threading steel pipe correctly and figuring piping measurement are also covered. The course teaches the layout techniques for fabricating residential duct fittings. *Five credit hours.*

HVA1012 Fundamentals of Heat Transfer and Domestic Applications Shop

This course involves learning how to use hand tools properly and safely. Accurate trade measurements will be taken along with making leak-tight flare connections on copper tubing. Students will take readings on and monitor actual refrigeration systems and room air conditioners. Procedures such as recovery, evacuation, leak testing and charging of refrigerant will be performed. Students will learn to solder and braze tubing using various heat sources and alloys. Students will thread and put steel pipe together properly. This course also involves the fabricating of over twenty residential sheet metal duct fittings and introduces students to various types of metering devices, with the review of gauge manifold and two-way service valves. Students learn charging methods, trouble diagnosis and the proper operation of a refrigerator. This course

then continues with trouble diagnosis, charging and performing operational checks. *Eight credit hours.*

HVA1001 Electrical for HVACR Theory

This course introduces basic electrical theory, Ohm's law, insulators, conductors, switches and loads. Electrical meters are also introduced along with basic circuitry. Students will competently have the ability to read and produce wiring/ladder diagrams. Students will be proficient in wiring and trouble-shooting control circuits. The course continues with electrical symbols, capacitors and motors. Students are introduced to hermetic compressors, relays, control circuits and fan relays. *Five credit hours.*

HVA1002 Electrical for HVACR Shop

Students wire simple, series and parallel circuits and apply Ohm's law. Students identify and test components outlined in the theory section, construct electrical circuits and use electrical meters to measure voltage resistance and current. This course also teaches students to wire and operate hermetic compressors, relays, control circuits and fan relays. *Eight credit hours.*

HVA2111 Commercial Refrigeration and Light Commercial Heat/AC Theory

Covers principles of commercial refrigeration and light heat/air conditioning (AC) theory, including function and operation sequence of component parts for a variety of refrigeration, 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 size refrigeration parts and diagnose electrical circuits, refrigeration circuits, water circuits and air circuits for different refrigeration systems. Class systematically approaches problem diagnosis in a wide variety of commercial refrigeration and light air conditioning systems, as well as sizing components to select proper replacement parts following trouble analysis. Covers

fundamentals of hydronics (heating or cooling by circulation of a fluid), steam heat and special controls, diagnosis, charging and checkout procedure and principles of pneumatic controls. Building automated systems used in the control and monitoring of facilities, energy use and zone comfort conditions are also covered. *Five credit hours.*

HVA2112 Commercial Refrigeration and Light Commercial Heat/AC Shop

Students wire, determine proper operation, troubleshoot and repair commercial refrigeration systems such as walk-in coolers, reach-in freezers, open display cases, milk dispensers, glass frosters, beverage coolers, beer dispensing equipment and light commercial AC systems and accessories. Operations of simple building controls are also covered. *Eight credit hours.*

HVA2211 Residential Heat/Air and Commercial Ice Makers Theory

Provides an overview of gas and electric furnaces and controls, thermostats, transformers, thermocouple and induced draft, flame sensor circuits piping and venting. Focuses on operating

and troubleshooting residential air conditioning, heat pumps and heating equipment. Two-stage systems, variable speed blowers, Indoor Air Quality (IAQ) products and commercial ice maker equipment systems will all be covered. *Five credit hours.*

HVA2212 Residential Heat/Air and Commercial Ice Makers Shop

Involves wiring and checkout of furnace and controls, thermostats and transformers, thermocouple and induced draft, flame sensing, piping and venting of gas furnaces. Emphasis is placed on service skills and systematic trouble diagnosis. Course introduces trouble diagnosis of electrical, refrigeration and airflow of residential air conditioning equipment. Students wire, charge, test and troubleshoot heat pumps. Students install and start new systems at the job site of the homes in Ranken's Ranken Community Development Corporation (RCDC) program. Covers installation and sequence of the major manufacturers' ice makers. *Eight credit hours.*

EVENING PROGRAM CERTIFICATE IN HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION TECHNOLOGY

This program offers preparation at the mechanics level covering equipment servicing and repair. As the curriculum progresses, special attention is given to electrical applications—particularly to control circuits. These classes meet on Monday and Wednesday or Tuesday and Thursday evenings. For students interested in furthering their education, these courses can be credited toward the Bachelor of Science in Applied Management (BSAM) degree.

EVENING PROGRAM COURSES			HOURS	PREREQUISITES
First or Second Semester	HVA0100	Fundamentals of Heat Transfer and Domestic Applications	6	
First or Second Semester	HVA0101	Electrical for HVACR	6	
Third or Fourth Semester	HVA0230	Residential HVAC and Heat Pumps	6	HVA0100, HVA0101
Third or Fourth Semester	HVA0240	Commercial Refrigeration/AC and Heating	6	HVA0100, HVA0101
<i>Total Technical Credit Hours for Certificate Completion</i>			24	

COURSE DESCRIPTIONS

HVA0100 Fundamentals of Heat Transfer and Domestic Applications

This course introduces the basics of refrigeration, including a description of what is taking place inside each component and the lines connecting them. Students learn to read a temperature/pressure chart and apply it to various refrigerants which are used in the trade. Common service procedures such as gauge installation, evacuation and recovery of refrigeration are also covered in the course. Students are exposed to trade measurements and are given theory behind what it takes to make a good solder and braze connection on copper tubing. This course introduces students to pressures, temperatures and running times for refrigerators and room air conditioners and continues with charging, service and

operation of domestic refrigerators and room air conditioners *Six credit hours.*

HVA0101 Electrical for HVACR

Study includes capacitors, current relays, potential relays and solid-state relays. Students practice methods used to recognize each relay and wire each relay circuit with its hermetic compressors. The course incorporates the wiring of basic fan relays, contactors and sequencers. Additionally, this course provides an overview of the different means of wiring, charging and problem diagnosis of domestic refrigerators and window air-conditioners. Troubleshooting through an electrical schematic is a staple of this course. Emphasis is placed on problem analysis of system operation. *Six credit hours.*

HVA0230 Residential HVAC and Heat Pumps

Introduction to heat pumps, including various types, specific components, basic operation and common problems. Both major types of refrigerants are used in the shop equipment. This provides each student with exposure to the current refrigerant and the newer non-ozone depleting refrigerant. Students are able to service an air conditioner and heat pump, troubleshoot the reversing valve and evaluate various defrost systems of a heat pump. Electric and gas furnaces are also covered. The prominent gas flame ignition devices and the various methods used to operate a gas furnace will be covered along with the different equipment fuel efficiencies. Proper flue gas venting is also covered, primarily categories I and IV. *Six credit hours.*

HVA0240 Commercial Refrigeration/AC and Heating

Introduces commercial refrigeration theory, which includes the function and sequence of the operation of component parts on various refrigeration systems; including, but not limited to, reach-in and walk-in coolers, beverage coolers and reach-in freezers. Students focus on the development of a systematic approach to diagnosing problems in commercial refrigeration. Low outdoor operating conditions, various refrigeration loads and the components used to assist a refrigeration system to perform correctly during these conditions will also be covered. This includes un-loaders, fan cycling controls, hot gas by-pass valves and others. Rooftop and light commercial AC and heating equipment will also be covered in this semester. The student will wire in complex motor control circuits and evaluate the performance data from the equipment for optimum operation. *Six credit hours.*

MAJOR APPLIANCE TECHNOLOGY

Home appliances play an essential role in the daily routine of the average American household. Accordingly, there has been a tremendous rise in the quantity and variety of household electrical appliances marketed today. 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, practical experience in troubleshooting and repairing gas and electric components for many 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 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.

DAY PROGRAM COURSES			HOURS	PREREQUISITES
First or Second Semester	HVA1011	Fundamentals of Heat Transfer and Domestic Applications Theory	5	
	HVA1012	Fundamentals of Heat Transfer and Domestic Applications Shop	8	
First or Second Semester	HVA1001	Electrical for HVACR Theory	5	
	HVA1002	Electrical for HVACR Shop	8	
Third or Fourth Semester	HVA2111	Residential Heat/Air and Commercial Ice Makers Theory	5	All 1000 level courses
	HVA2112	Residential Heat/Air and Commercial Ice Makers Shop	8	All 1000 level courses
Third or Fourth Semester	MAT2211	Major Appliances Technology Theory	5	All 1000 level courses
	MAT2212	Major Appliances Technology Shop	8	All 1000 level courses
<i>Total Technical Credit Hours Required</i>			52	

GENERAL EDUCATION COURSES			HOURS	PREREQUISITES
English/Social Sciences	ENG1101	College Composition I	3	Placement Exam or 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 and MTH1111 Intermediate Algebra or	6	Placement Exam or MTH1099
	MTH1100	Elementary/Intermediate Algebra	3	Placement Exam
Business/Information Technology	BUS1000	Career Success Skills	3	
	MNG1204	Intro to Business & Management	3	ENG1099 (Co. Req.)
Associate of Science	MTH2112	College Algebra	3	MTH1100 or MTH1111
Additional Required Courses	MTH2220	Trigonometry	3	MTH2112
	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

HVA1011 Fundamentals of Heat Transfer and Domestic Applications Theory

This course introduces the basics of refrigeration, including a description of what is taking place in each component and the lines connecting them. Students learn to read a temperature/pressure chart and apply it to various refrigerants which are used in the trade. Common service procedures such as gauge installation, evacuation and recovery of refrigeration are also covered in this course. Students are exposed to trade measurements and are given theory behind what it takes to make a good solder and braze connection on copper tubing. This course introduces students to pressures, temperatures and running times for refrigerators and room air conditioners and continues with charging, service and operation of domestic refrigerators and room air conditioners. Principles of threading steel pipe correctly and figuring piping measurement are also covered. The course teaches the layout techniques for fabricating residential duct fittings. *Five credit hours.*

HVA1012 Fundamentals of Heat Transfer and Domestic Applications Shop

This course involves learning how to use hand tools properly and safely. Accurate trade measurements will be taken along with making leak-tight flare connections on copper tubing. Students will take readings on and monitor actual refrigeration systems and room air conditioners. Procedures such as recovery, evacuation, leak testing and charging of refrigerant will be performed. Students will learn to solder and braze tubing using various heat sources and alloys. Students will thread and put steel pipe together properly. This course also involves the fabricating of over twenty residential sheet metal duct fittings and introduces students to various types of metering devices, with the review of gauge manifold and two-way service valves. Students learn charging methods, trouble diagnosis and the operation of a refrigerator. This course then continues with trouble diagnosis, charging and performing operational checks. *Eight credit hours.*

HVA1001 Electrical for HVACR Theory

This course introduces basic electrical theory, Ohm's law, insulators, conductors, switches and loads. Electrical meters are also introduced along with basic circuitry. Students will competently have the ability to read and produce wiring/ladder diagrams. Students will be proficient in wiring and trouble-shooting control circuits. The course continues with electrical symbols, capacitors and motors. Students are introduced to hermetic compressors, relays, control circuits and fan relays. *Five credit hours.*

HVA1002 Electrical for HVACR Shop

Students wire simple, series and parallel circuits and apply Ohm's law. Students identify and test components outlined in the theory section, construct electrical circuits and use electrical meters to measure voltage resistance and current. This course also teaches students to wire and operate hermetic compressors, relays, control circuits and fan relays. *Eight credit hours.*

HVA2211 Residential Heat/Air and Commercial Ice Makers Theory

Provides an overview of gas and electric furnaces and controls, thermostats, transformers, thermocouple and induced draft, flame sensor circuits piping and venting. Focuses on operating and troubleshooting residential air conditioning, heat pumps and heating equipment. Two-stage systems, variable speed blowers, Indoor Air Quality (IAQ) products and commercial ice maker equipment systems will all be covered. *Five credit hours.*

HVA2212 Residential Heat/Air and Commercial Ice Makers Shop

Involves wiring and checkout of furnace and controls, thermostats and transformers, thermocouple and induced draft, flame sensing, piping and venting of gas furnaces. Emphasis is placed on proper service skills and systematic trouble diagnosis. Course introduces trouble diagnosis of electrical, refrigeration and airflow of residential air conditioning equipment. Students will wire, charge, test and troubleshoot heat pumps. Students install and start new systems at the job site of the homes in Ranken's Ranken Community Development Corporation (RCDC) program. Covers installation and sequence of the major manufacturers' ice makers. *Eight credit hours.*

MAT2211 Major Appliances Technology Theory

This course introduces students to the repair and service industry for electrical and gas appliances, including washers, dryers, ranges, microwave ovens and dishwashers. In addition to covering theory, students will work on real appliances and learn job skills in a workshop setting. Students will develop a full knowledge of a variety of appliances and will be able to diagnose and repair many in-home major appliances. Instruction will also include fundamental skills for tracing and completing electrical circuits for major appliances. The course emphasizes effective communication and customer relations skills to prepare students for employment opportunities in in-home work environments. *Five credit hours.*

MAT2212 Major Appliances Technology Shop

This course is a hands-on, service application of course MAT2211. *Eight credit hours.*

EVENING PROGRAM CERTIFICATE IN MAJOR APPLIANCE TECHNOLOGY

This program offers preparation at the mechanical level covering equipment servicing and repair. As the curriculum progresses, special attention is given to electrical applications—particularly to control circuits.

For students interested in furthering their education, these courses can be credited toward the Bachelor of Science in Applied Management (BSAM) degree.

EVENING PROGRAM COURSES			HOURS	PREREQUISITES
First or Second Semester	HVA0100	Fundamentals of Heat Transfer and Domestic Applications	6	
First or Second Semester	HVA0101	Electrical for HVACR	6	
Third or Fourth Semester	MAT0230	Laundry Appliances	6	HVA0100, HVA0101
Third or Fourth Semester	MAT0240	Kitchen Appliances	6	HVA0100, HVA0101
<i>Total Technical Credit Hours for Certificate Completion</i>			<i>24</i>	

COURSE DESCRIPTIONS

HVA0100 Fundamentals of Heat Transfer and Domestic Applications

This course introduces the basics of refrigeration, including a description of what is taking place inside each component and the lines connecting them. Students learn to read a temperature/pressure chart and apply it to various refrigerants which are used in the trade. Common service procedures such as gauge installation, evacuation and recovery of refrigeration are also covered in the course. Students are exposed to trade measurements and are given theory behind what it takes to make a good solder and braze connection on copper tubing. This course introduces students to pressures, temperatures and running times for refrigerators and room air conditioners and continues with charging, service and operation of domestic refrigerators and room air conditioners. *Six credit hours.*

HVA0101 Electrical for HVACR

Study includes capacitors, current relays, potential relays and solid-state relays. Students practice methods used to recognize each relay and wire each relay circuit with its hermetic compressors. The course incorporates the wiring of

basic fan relays, contactors and sequencers. Additionally, this course provides an overview of the different means of wiring, charging and problem diagnosis of domestic refrigerators and window air-conditioners. Troubleshooting through an electrical schematic is a staple of this course. Emphasis is placed on problem analysis of system operation. *Six credit hours.*

MAT0230 Laundry Appliances

This course introduces the student to laundry equipment service and installation. Emphasis is placed on electric and gas dryers, as well as automatic washers. Upon completion, students should be able to service and install laundry equipment and water heaters. *Six credit hours.*

MAT0240 Kitchen Appliances

This course introduces the student to installation and service of kitchen equipment. Emphasis is placed on ranges, dishwashers, compactors, and disposals. Upon completion, students should be able to install and service gas and electric ranges, dishwashers and garbage disposals. *Six credit hours.*

PLUMBING TECHNOLOGY

Life and good health in any community depend upon an ample supply of potable water—and the ability to share and maintain this valuable resource. To meet this ongoing need, Ranken Technical College offers a nine-month certificate program in Plumbing Technology to train individuals to install, maintain and repair residential plumbing systems. Our program is highly regarded in the St. Louis regional plumbing community and is one of the four original programs offered by Ranken since 1907.

The program prepares graduates to enter the plumbing field as advanced technicians, estimators, maintenance mechanics, plumbing sales representatives and pipefitters for industrial companies. Graduates also enroll in the plumbing program to gain industry knowledge and experience prior to entering a professional apprenticeship program.

CERTIFICATE OF TECHNOLOGY

Throughout this nine-month program, students will be provided with hands-on training and instruction in:

- Sanitary drainage systems
- Hot and cold water systems
- Pipefitting
- Venting
- General electricity principles
- Industry tools and new technologies

In addition, the program curriculum includes basic studies of related industries, including surveying, commercial hydronic heating systems, boiler and steam fundamentals and basic computer skills.

For students interested in furthering their education, these courses are creditable toward our Associate of Applied Science (AAS) and Bachelor of Science in Applied Management (BSAM) degrees.

DAY PROGRAM COURSES			HOURS	PREREQUISITES
First Semester	PLT1000	Plumbing and Pipefitting	20	
Second Semester	PLT2000	Residential and Commercial Plumbing	20	PLT1000
<i>Total Technical Credit Hours for Certificate Completion</i>			40	

GENERAL EDUCATION COURSES			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

PLT1000 Plumbing and Pipefitting

Plumbing and Pipefitting will give students a foundation in safety and plumbing related subjects such as traps, drainage, waste, vent systems, plumbing fixtures, plumbing appliances, storm drainage, and private sewage disposal. Students will also be introduced to plumbing code and perform plumbing system inspections. In this class students will learn by doing hands-on work on a live construction site and shop work with basic pipefitting projects such as, using threading equipment, making pipe nipples, assembling and testing steel, copper, plastic and cast iron pipes for water-tightness. They will also install a variety of plumbing fixtures in a simulated work environment. An introduction to the basics of plumbing math and drafting will also be covered. *Twenty credit hours.*

PLT2000 Residential and Commercial Plumbing

In Residential and Commercial Plumbing students will perform work to "code" on a live construction site and work on bathroom and kitchen projects such as installing kitchen sinks, garbage disposals, dishwashers and water conditioning equipment. Students will also perform the installation of water heaters, laundry room fixtures, sump pumps and hot water boilers. Surveying and laying out sewer trenches will be a skill that students will learn, as well as instruction in backflow protection for public and domestic water systems. Boiler technology and the application of electrical fundamentals to the discipline of plumbing will be covered. *Twenty credit hours.*

EVENING PROGRAM CERTIFICATE IN PLUMBING TECHNOLOGY

Evening students can earn a certificate in Plumbing Technology by pursuing this program. These courses combine classroom and shop experience to provide overall instruction, hands-on

training and experience in the practices and skills needed by area-wide employers.

To earn a certificate in Plumbing Technology, students must complete two courses that encompass the pipefitting and plumbing systems curriculum.

EVENING PROGRAM COURSES			HOURS	PREREQUISITES
First Semester	PLT0110	Pipefitting Theory and Practice	6	
Second Semester	PLT0100	Plumbing Systems Theory and Practice	6	
<i>Total Technical Credit Hours for Certificate Completion</i>			12	

COURSE DESCRIPTIONS

PLT0110 Pipefitting Theory and Practice

Covers the use of basic hand and power tools for cutting and threading steel pipe and cutting and joining copper pipe, using both hard and soft soldering methods. The course includes practical mathematics and layout methods as it applies to the piping trade. Also, the course covers drain waste vent piping systems, the use of copper and cast iron and plastic pipe, along with related fittings. *Six credit hours.*

PLT0100 Plumbing Systems Theory and Practice

Covers plumbing for the home owner or handyman, with hands-on application and theories about plumbing safety, drainage, waste, vent systems, plumbing fixtures, plumbing appliances and hot and cold water supply systems. Plumbing system inspections and tests are included. *Six credit hours.*