

MNG1224 AUTOMOTIVE SERVICE MANAGEMENT

This online course provides students with an understanding of the characteristics, organization, structure, operations and management of the automotive service business. Students will gain a sound foundation of the automotive service business world as they prepare for business or other careers. The objectives of this course are accomplished through the use of case studies and critical thinking exercises and are designed to meet the objectives of the Automobile Service Consultant (ASE). Three credit hours.

WFD1224 AUTOMOTIVE JOB SEARCH SUCCESS

Automotive job search success is an online course that focuses on the fundamental tools and techniques to obtain an automotive job. Students will create a resume, including references and an updated work history. Students explore interview techniques, gather information in cover and thank you letters and become knowledgeable of appropriate behaviors and attitudes for a successful job search. One credit hour.

EVENING PROGRAM CERTIFICATE IN HIGH PERFORMANCE RACING TECHNOLOGY

The High Performance Racing Technology (HPRT) evening program allows students to gain training in aftermarket engine performance improvement. Our specialized instruction allows students to design and build any type of high performance engine using a wide variety of aftermarket engine components and control systems, to tune it for maximum output and drivability using various data acquisition tools and dynamometers.

The focus is on both engines and tuning. Students entering this program must have a foundation of mechanical repair. Past Ranken Automotive Maintenance Technology (AMT) associate degree graduates are automatically qualified to enter into the program. Past Ranken AMT certificate graduates or current automotive technicians may enter the program with approval from the automotive division chair. Classes typically meet Monday -Thursday, 6:00 p.m. - 10:00 p.m. For more information about the acceptance requirements for the HPRT program, please contact the Admissions office at (314) 286-4809.

HPRT graduates accept employment in automotive machine shop/ race shops, automotive tuner/repair shops, aftermarket part

manufacturers/suppliers, professional racing teams and aftermarket tool manufacturers/suppliers.

Successful completion of both semesters is necessary to qualify for a certificate.

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

ASSOCIATE OF APPLIED SCIENCE

Ranken is offering an Associate of Applied Science degree as a part of the evening program curriculum. You can earn your associate degree with a combination of Ranken's standard evening school courses as well as our new online courses. You can also transfer credit from other accredited technical training programs, or have your technical work experience evaluated for possible transfer credit. (30 technical credit hours required for graduation.)

For all General Education course requirements, please turn to page 87. For more information about the BSAM degree, please turn to page 90.

PROGRAM COURSES			Hours	Prerequisites
First or Second Semester	AHP2202	High Performance Engines	12	AMT associate degree from Ranken or
	AHP2220	High Performance Tuning	12	successful completion of the online course.
Total Technical Credit Hours for Certificate Completion			24	

COURSE DESCRIPTIONS

AHP2202 HIGH PERFORMANCE ENGINES

Contains training on the entire engine machining process. Starting from engine teardown and ending with assembly and dynamometer performance verification, students learn all of the required machining processes for rebuilding a stock type engine. Throughout the course, students also learn the math and science behind the development of a proper high performance power plant while also learning to assemble a high performance engine properly. They will be able to run a complete dyno test to find out how close they are to their desired performance. Twelve credit hours.

AHP2220 HIGH PERFORMANCE TUNING

This offers a highly interactive look at many of the engine performance and control components used in the high performance tuning industry. Intake and cylinder head air flow improvements such as increased valve size, porting, bigger throttle bodies and exhaust systems are among some of the topics covered. This course covers a wide variety of engine fuel and ignition control systems. The design and application of turbocharger and supercharger systems for gasoline and diesel engines will also be covered, along with nitrous and propane injection. Students learn carburetor modification and tuning and power train gearing and suspension systems. Twelve credit hours.

CONSTRUCTION  **DIVISION**



ARCHITECTURAL TECHNOLOGY

Combining critical thinking skills, state-of-the-art technology and hands-on experience, the Architectural Technology (ART) 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 ART 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.

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 Division, 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®, AutoCAD Architecture 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, Revit Architecture, as well as, a breadth of other graphics software. At the beginning of their first semester, students are issued a notebook computer for lease during their academic career at Ranken Technical College, with a buyout option upon completion of the program.

ASSOCIATE OF SCIENCE IN ARCHITECTURAL TECHNOLOGY

For students who wish to complete only two years of introductory architectural technology and drafting training, the program offers an associate of science degree option. Receiving this degree does not preclude a student from continuing to pursue the bachelor's degree.

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
Second Semester	ART1224 Principles of Design	6	ART1113, MTH1110
	ART1225 Materials and Methods II	3	MTH1110
	ART2121 Structures I	2	MTH1111 (Co. Req.)
Third Semester	ART2120 Architectural Technology Studio I	6	MTH1110
	ART2123 Building Systems Design	3	MTH1110
	ART2222 Structures II	2	ART2121, MTH2112 (Co. Req.)
Fourth Semester	ART1222 Site Engineering and Survey	3	ART2220; MTH2220 (Co. Req.)
	ART2220 Architectural Technology Studio II	6	ART2120
	ART2221 Architectural History I	3	HIS1211, ENG1101
Fifth Semester	ART3113 3D Modeling and Graphic Presentation	3	ART2120
	ART3120 Architectural Technology Studio III	6	ART2220
Sixth Semester	ART3220 Junior Architectural Studio	7	ART2220, ART3113
	ART3221 Architectural History II	3	ART2221
	ART3223 Design Integration with Building Information Modeling (BIM)	3	ART3120

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- 44 MAJOR APPLIANCE TECHNOLOGY
- 48 PLUMBING TECHNOLOGY

PROGRAM COURSES (CONTINUED)			Hours	Prerequisites
Seventh Semester	ART4112	Professional Practice	3	ENG2102
	ART4120	Senior Architectural Studio I	7	ART2220, ART3113
	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 Studio II	7	ART2220, ART3113
Total Technical Credit Hours Required			90	
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	
	HIS1211	Western Civilization	3	ENG1099 (Co. Req.)
	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
	MTH2112	College Algebra	3	MTH1100 or MTH1111
	MTH2220	Trigonometry	3	MTH2112
	PHY2230	College Physics	3	MTH2220
	MTH2240	Survey of Calculus	3	MTH2112
Business/Information Technology	CIT1100	Computer Literacy	2	
	WFD1200	Job Search Success	1	MNG1220 or BUS1204 (Co. Req.)
	MNG1204	Introduction to Business and Management	3	ENG1099 (Co. Req.)
Electives (Two Required)	ART2000	Construction Management	3	
	ART3024	Principles of LEED	3	
	ART4200	Internship	3	
	ART3022	Interior Design	3	

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 principle factors affecting residential and small commercial structures are covered. Particular consideration is given to foundation, floor, wall and roof construction including sustainability. Three credit hours.

ART1222 SITE ENGINEERING AND SURVEYING

This course consists of two portions: The first part of the course is a lecture and studio class, which includes site planning, building site orientation, site circulation, site security, grading, utilities, hydraulics and landscaping.

The second part is the theory and practice of plane surveying including distance measurement, differential leveling, profile leveling and record keeping. 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 class designed to give a student the skills necessary to produce typical details for a given commercial building project. The student will discover and resolve detailing problems. This course will take the student through the more typical types of detailing needed to construct a building using AutoCAD. Three credit hours.

ART2000 CONSTRUCTION MANAGEMENT

Covers construction project delivery systems, project team members, construction documents, jobsite layout and control, subcontracting and quality management. 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, Photoshop® project 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

Architectural Technology Studio II 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 together with building codes and ADA regulations. The student will also be responsible for compiling their portfolio for a formal review at the end of the semester. 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. 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, AutoCAD Architecture®, 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.

ART3223 DESIGN INTEGRATION WITH BUILDING INFORMATION MODELING (BIM)

This course will introduce students to the concept of project design and coordination using Building Information Modeling (BIM). The student will design and draw a portion of a building project and learn to integrate their work into the overall project. They will be required to coordinate their work with that of other students and how to manage worksets with Revit Architecture software. Three credit hours.

ART3220 JUNIOR 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 learn 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 present day. The content of this course is delivered through slide shows and class discussions. 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 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 learn 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 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 learn correct design presentation methods. Seven credit hours.

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 to erect residential buildings and perform some light commercial construction. The carpentry program also prepares students to hold a job in the field by providing instruction about crew dynamics 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 portable 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.

Approximately three-fourths of all associate of technology carpentry graduates begin union apprenticeship programs with advanced standing upon graduation. Students interested in completing the certificate of technology program will take all technical courses in the associate degree program and two general education courses.

Upon completion of the associate degree program, students are eligible for the Bachelor of Science in Applied Management (BSAM) program – and could graduate with a bachelor's degree in as little as two short years.

PROGRAM COURSES			Hours	Prerequisites
First Semester	CRP1110	Residential Blueprint Reading	2	
	CRP1111	Tools, Wood, Walls, Stairs and Stakeout Theory	3	
	CRP1112	Construction Practices I Shop	8	
Second Semester	CRP1210	Construction Estimating and Management	2	
	CRP1211	Rafters, Roof, Truss and Concrete Forming Theory	3	
	CRP1212	Construction Practices II Shop	8	
Third Semester	CRP2101	Residential Housing Construction I	15	
Fourth Semester	CRP2201	Residential Housing Construction II	15	
	CRP2202	Construction Welding	2	
Total Technical Credit Hours Required			58	
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	CIT1100	Computer Literacy	2	
	WFD1200	Job Search Success	1	MNG1220 or BUS1204 (Co. Req.)
	MNG1204	Introduction to Business and Management	3	ENG1099 (Co. Req.)
Associate of Science	MTH2112	College Algebra	3	MTH1100 or MTH1111
Additional Required	MTH2220	Trigonometry	3	MTH2112
Courses	PHY2230	College Physics (Substitute for PHY2100)	3	MTH2220
	MTH2240	Survey of Calculus	3	MTH2112

GENERAL EDUCATION COURSES (certificate of technology)			Hours	Prerequisites
	COM1080	Technical Communications	3	
	CIT 1110	Computer Literacy	2	
	WFD1200	Job Search Success	1	
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 blueprint production. The course covers the types of views, all related symbols and details on working drawings and the different kinds of drawings. The course also covers sketching skills that will encourage graphic communication. Students will also learn how to efficiently manipulate dimensions and details on a full set of residential blueprints to facilitate the construction process. Two credit hours.

CRP1111 TOOLS, WOOD, WALLS, STAIRS AND STAKEOUT THEORY

The course introduces basic hand and portable/stationary power tool identification and usage. The course involves explanations of assorted fasteners used in residential and commercial building construction. Different species of softwoods for structural framing and hardwoods for finish work is also covered. The course provides an overview of various leveling instruments and an in-depth study of both wood and metal-framed floor, wall and ceiling systems. Students will learn how to calculate, layout and construct a straight-flight residential staircase. Students will learn about the composition of drywall sheet-good products, engineered wood products and different types and profiles of trim work and wall moldings. This course introduces the basic parts of a door and window and also recommended installation techniques for vinyl siding, soffit and fascia. Three credit hours.

CRP1112 CONSTRUCTION PRACTICES I

Shop provides hands-on experience in applying the theory taught in CRP1111. The course covers general woodworking, building stakeout, subfloor construction, wall framing, stair building, door hanging, window installation, drywall, installing trim work and exterior siding. Eight credit hours.

CRP1210 CONSTRUCTION ESTIMATING AND MANAGEMENT

This course offers an in-depth study of blueprint reading with a complete set of actual building blueprints. Students perform construction estimating, job scheduling and develop a building material order list. Students will also learn what makes up a construction contract and how to submit a proposal. Two credit hours.

CRP1211 RAFTERS, ROOF, TRUSS AND CONCRETE FORMING THEORY

This course introduces multiple roofs and roof combinations, step-by-step layout procedures and calculations for a variety of roof designs. Students identify and apply the standard truss designs used in residential construction. The course covers layout procedures for setting roof trusses, how to read roof framing truss plans and how to read detailed roof framing diagrams. It also covers the different types and weights of shingles, including layout and application procedures and the construction of concrete forms. Three credit hours.

CRP1212 CONSTRUCTION PRACTICES II SHOP

This course provides hands-on experience in applying the theory taught in CRP1211. Students learn all aspects of roof framing and layout, including hand-built roofs and roof combinations. Students will also learn how to read a truss plan and install gable and hip trusses on a wood-framed wall system. Roof shingles and water prevention/flashing techniques are also covered in this course. Different types of concrete formwork for full-basement foundations, bridge and deck forms and exterior flatwork are introduced in this course. 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 all doors and windows, coffered ceilings and vinyl siding, soffit and fascia. Nova 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. Fifteen credit hours.

CRP2201 RESIDENTIAL HOUSING CONSTRUCTION II

In continuation of CRP2101, this course provides hands-on opportunities to complete all of the finish work in a residential structure. Students hang and finish drywall, install interior doors and install base trim, window trim packages and crown mould. Students also frame the beams for a front porch, as well as set the finish 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 layout, install and pour the concrete in all footing and foundation forms for the next year's program. Students will build a wood privacy fence and do basic landscaping around the perimeter of the home. Shielded metal arc welding and cutting/burning will be introduced as part of this course. Fifteen credit hours.

CRP2202 CONSTRUCTION WELDING

Students will learn the necessary skills and techniques for basic welding and burning operations used in the residential and commercial sector of the construction industry. The main process that will be covered in this course is Shielded Metal Arc Welding (SMAW/Stick Welding). Students will weld on mild steel plates in horizontal and flat positions. In addition to SMAW, students will also learn how to use oxy-fuel cutting to burn small holes and straight lines in mild steel. The final project will involve cutting and burning mild steel pieces 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 wall, roof and finish
- Install windows and doors
- Install floors and ceilings
- Build basic stairs
- Construct concrete forms
- Shielded Metal Arc Welding, Flux Cored Arc Welding, Gas Metal Arc Welding and Gas Tungsten Arc Welding

These classes meet on Mondays and Wednesdays or Tuesdays and Thursdays from 6:00 p.m. to 9:30 p.m.

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.

ASSOCIATE OF APPLIED SCIENCE

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PROGRAM COURSES			Hours	Prerequisites
CRP0110	Exterior/Interior Frame Construction		6	
CRP0120	Interior Finish		6	
FWL0110	Welding I		6	
Total Technical Credit Hours for Certificate Completion			18	

COURSE DESCRIPTIONS

CRP0110 EXTERIOR/INTERIOR FRAME CONSTRUCTION

This course covers basic carpentry math calculations of fractions and decimals as well as right angle trigonometry. Students will learn how to identify and safely operate a multitude of different hand and portable/stationary power tools. The course also covers how to set up and operate leveling instruments. Concrete framework, 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. Time permitting, students will install roof shingles and learn proper flashing and water prevention techniques. Six credit hours.

CRP0120 INTERIOR FINISH

This course covers many 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. 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) welding, Flux Cored Arc Welding (FCAW), Gas Metal Arc Welding (GMAW) and Gas Tungsten Arc Welding (TIG), to be applied on various metals. The emphasis is to develop proper welding techniques in the flat and horizontal positions. The procedures for preparing materials – oxy-fuel cutting and carbon arc gouging – are included in the curriculum. Six credit hours.

HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION TECHNOLOGY

HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION TECHNOLOGY (CONTINUED)

In homes, offices, factories and schools, the air conditioning and heating industries are providing year-round temperature, humidity and air quality control options, which are improving global standards of living. Careers in refrigeration, air conditioning and heating provide highly necessary services to people everywhere.

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.

ASSOCIATE OF TECHNOLOGY, ASSOCIATE OF SCIENCE OR CERTIFICATE OF TECHNOLOGY

In this full-time, two-year 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 and two additional general education courses.

Students who obtain an HVACR associate degree can choose to receive more in-depth training in Major Appliance Technology by taking one extra semester. Upon completion of the extra semester, students will receive an associate degree in both Major Appliance Technology and HVACR.

Once the associate degree program is completed, students are eligible for the Bachelor of Science in Applied Management (BSAM) program – and could graduate with a bachelor's degree in as little as two short years.

PROGRAM COURSES		Hours	Prerequisites
First Semester	HVA1111 Basic Refrigeration Theory	3	
	HVA1112 Basic Refrigeration Shop	4	
	HVA1110 Introduction to Electrical and HVACR Theory	3	
	HVA1120 Introduction to Electrical and HVACR Shop	4	
Second Semester	HVA1210 Sheet Metal Fabrication, Piping and Housing Wiring Theory	3	
	HVA1220 Sheet Metal Fabrication, Piping and Housing Wiring Shop	4	
	HVA1215 Domestic Systems Theory	3	HV11100 courses
	HVA1216 Domestic Systems Shop	4	
Third and Fourth Semester	HVA2111 Commercial Refrigeration and Heat/AC Theory	5	HVA1200 courses
	HVA2112 Commercial Refrigeration and Heat/AC Shop	8	
Third and Fourth Semester	HVA2211 Residential Heat/Air and Commercial Ice Makers Theory	5	HVA1200 courses
	HVA2212 Residential Heat/Air and Commercial Ice Makers Shop	8	
Total Technical Credit Hours Required		54	

Important Note: Third and fourth semesters may be taken in any order.

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
	PHY2100	Conceptual Physics	3	MTH 1110
Business/Information Technology	CIT1100	Computer Literacy	2	
	WFD1200	Job Search Success	1	MNG1220 or BUS1204 (Co. Req.)
	MNG1204	Introduction to Business and Management	3	ENG1099 (Co. Req.)
Associate of Science	MTH2220	Trigonometry	3	MTH2112
Additional Required Courses	PHY2230	College Physics (Substitute for PHY2100)	3	MTH2220
	MTH2240	Survey of Calculus	3	MTH2112

GENERAL EDUCATION COURSES (certificate of technology)			Hours	Prerequisites
	COM1080	Technical Communications	3	
	CIT 1110	Computer Literacy	2	
	WFD1200	Job Search Success	1	

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

COURSE DESCRIPTIONS

HVA1111 BASIC REFRIGERATION THEORY

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 is 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 and a weld joint on mild steel. Three credit hours.

HVA1112 BASIC REFRIGERATION SHOP

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. 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. Arc welding on mild steel will also be introduced. Four credit hours.

HVA1110 INTRODUCTION TO ELECTRICAL AND HVACR THEORY

Introduces basic electrical theory, Ohm's Law, insulators, conductors, switches and loads. Electrical meters are also introduced along with basic circuitry. The course continues with electrical symbols, capacitors and motors. Students are introduced to hermetic compressors, relays, control circuits and fan relays. Three credit hours.

HVA1120 INTRODUCTION TO ELECTRICAL AND 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. Four credit hours.

HVA1210 SHEET METAL FABRICATION, PIPING AND HOUSE WIRING THEORY

Covers principles of threading steel pipe correctly, along with properly figuring piping measurement. The course teaches the proper lay out techniques for fabricating residential duct fittings. Students will be exposed to the National Electrical Code and lockout tagout procedures. Common house wiring circuits are also covered. Three credit hours.

HVA1220 SHEET METAL FABRICATION, PIPING AND HOUSE WIRING SHOP

Students will thread and put steel pipe together properly, in addition to learning the most common conduit bends. This course also involves the fabricating of over twenty residential sheet metal duct fittings and wiring house circuits ran in conduit and non-metallic cable. Four credit hours.

HVA1215 DOMESTIC SYSTEMS THEORY

Introduces students to the capillary tube system, proper pressures, temperatures and running times. The course continues with proper wiring, charging, service and operation of a domestic refrigerator. Students learn the wiring, charging, proper performance, sizing and operation of a room air conditioner. Three credit hours.

HVA1216 DOMESTIC SYSTEMS SHOP

Introduces students to the basic capillary tube system with the review of gauge manifold and two-way service valves. Students learn charging methods, wiring, trouble diagnosis and the proper operation of a refrigerator. This course then continues with automatic defrost timers, system wiring, trouble diagnosis, wiring, charging, checking, performance checking and sizing of room air conditioners. Four credit hours.

HVA2111 COMMERCIAL REFRIGERATION & LIGHT COMMERCIAL HEAT/AC THEORY

Covers principles of commercial refrigeration and light heat/air conditioning 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 and 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 & 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 & COMMERCIAL ICE MAKERS THEORY

Provides an overview of gas, oil 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 & 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 wire, charge, test and troubleshoot heat pumps. Students install and start-up new systems at the job site of the homes in Ranken's 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 Mondays and Wednesdays or Tuesdays and Thursdays from 6:00 p.m. to 9:30 p.m.

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

ASSOCIATE OF APPLIED SCIENCE

Ranken is offering an Associate of Applied Science degree as a part of the evening program curriculum. You can earn your associate degree with a combination of Ranken's standard evening school courses as well as our new online courses. You can also transfer credit from other accredited technical training programs, or have your technical work experience evaluated for possible transfer credit. (30 technical credit hours required for graduation.)

For all General Education course requirements, please turn to page 89. For more information about the BSAM degree, please turn to page 92.

PROGRAM COURSES			Hours	Prerequisites
First Semester	HVA0110	Fundamentals of Refrigeration and Electricity	6	
Second Semester	HVA0120	Domestic Equipment Diagnosis and Repair	6	HVA0110 (Co. Req.)
Third Semester or	HVA0230	Residential HVAC and Heat Pumps	6	HVA0120
Fourth Semester	HVA0240	Commercial Refrigeration/AC and Heating	6	HVA0120
Total Technical Credit Hours for Certificate Completion			24	

COURSE DESCRIPTIONS

HVA0110 FUNDAMENTALS OF REFRIGERATION AND ELECTRICITY

Introduces trade principles and the basics of refrigeration, including a description of what is taking place inside each of the main parts of a system. Students learn to read a temperature pressure chart, apply it to systems using different refrigerants and evaluate the system using their gauges. The course covers soldering and brazing of copper tubing. Also covered are basic electrical principles in a theory/shop format. Students begin with the nature of electricity and progress to electrical safety, electrical values, generation of electricity, electrical circuits, electrical meters and wiring diagrams. Additionally, residential wiring and control circuits are covered. Six credit hours.

HVA0120 DOMESTIC EQUIPMENT DIAGNOSIS AND REPAIR

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 being marketed today. Because many of these are complex automatic and semiautomatic 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, two-year program, students receive instruction in:

- Basic refrigeration and electricity theories
- Applied electrical circuits
- Piping and conduit bending
- 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 and two additional 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. Upon completion of the extra semester, students will receive an associate degree in both Major Appliance Technology and HVACR.

Once the associate degree program is completed, students are eligible for the Bachelor of Science in Applied Management (BSAM) program – and could graduate with a bachelor's degree in as little as two short years.

PROGRAM COURSES		Hours	Prerequisites
First Semester	HVA1111	Basic Refrigeration Theory	3
	HVA1112	Basic Refrigeration Shop	4
	HVA1110	Introduction to Electrical and HVACR Theory	3
	HVA1120	Introduction to Electrical and HVACR Shop	4
Second Semester	HVA1210	Sheet Metal Fabrication, Piping and Housing Wiring Theory	3
	HVA1220	Sheet Metal Fabrication, Piping and Housing Wiring Shop	4
	HVA1215	Domestic Systems Theory	3 HV11100 courses
	HVA1216	Domestic Systems Shop	4
Third Semester	HVA2211	Residential Heat/Air and Commercial Ice Makers Theory	5 HVA1200 courses
	HVA2212	Residential Heat/Air and Commercial Ice Makers Shop	8
Fourth Semester	MAT2211	Major Appliance Technology Theory	5
	MAT2212	Major Appliance Technology Shop	8
Total Technical Credit Hours Required			54
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
	PHY2100	Conceptual Physics	3 MTH 1110
Business/Information Technology	CIT1100	Computer Literacy	2
	WFD1200	Job Search Success	1 MNG1220 or BUS1204 (Co. Req.)
	MNG1204	Introduction to Business and Management	3 ENG1099 (Co. Req.)

MAJOR APPLIANCE TECHNOLOGY (CONTINUED)

GENERAL EDUCATION COURSES (CONTINUED)			Hours	Prerequisites
Associate of Science	MTH2220	Trigonometry	3	MTH2112
Additional Required Courses	PHY2230	College Physics (Substitute for PHY2100)	3	MTH2220
	MTH2240	Survey of Calculus	3	MTH2112
GENERAL EDUCATION COURSES (certificate of technology)			Hours	Prerequisites
	COM1080	Technical Communications	3	
	CIT 1110	Computer Literacy	2	
	WFD1200	Job Search Success	1	
Important Note: Only courses in which a grade of "C" or higher is earned may be applied toward this Ranken degree.				

COURSE DESCRIPTIONS

HVA1111 BASIC REFRIGERATION THEORY

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 is 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 and a weld joint on mild steel. Three credit hours.

HVA1112 BASIC REFRIGERATION SHOP

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. 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. Arc welding on mild steel will also be introduced. Four credit hours.

HVA1110 INTRODUCTION TO ELECTRICAL AND HVACR THEORY

Introduces basic electrical theory, Ohm's Law, insulators, conductors, switches and loads. Electrical meters are also introduced along with basic circuitry. The course continues with electrical symbols, capacitors and motors. Students are introduced to hermetic compressors, relays, control circuits and fan relays. Three credit hours.

HVA1120 INTRODUCTION TO ELECTRICAL AND 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. Four credit hours.

HVA1210 SHEET METAL FABRICATION, PIPING AND HOUSE WIRING THEORY

Covers principles of threading steel pipe correctly, along with properly figuring piping measurement. The course teaches the proper lay out techniques for fabricating residential duct fittings. Students will be exposed to the National Electrical Code and lockout tagout procedures. Common house wiring circuits are also covered. Three credit hours.

HVA1220 SHEET METAL FABRICATION, PIPING AND HOUSE WIRING SHOP

Students will thread and put steel pipe together properly, in addition to learning the most common conduit bends. This course also involves the fabricating of over twenty residential sheet metal duct fittings and wiring house circuits ran in conduit and non-metallic cable. Four credit hours.

HVA1215 DOMESTIC SYSTEMS THEORY

Introduces students to the capillary tube system, proper pressures, temperatures and running times. The course continues with proper wiring, charging, service and operation of a domestic refrigerator. Students learn the wiring, charging, proper performance, sizing and operation of a room air conditioner. Three credit hours.

HVA1216 DOMESTIC SYSTEMS SHOP

Introduces students to the basic capillary tube system with the review of gauge manifold and two-way service valves. Students learn charging methods, wiring, trouble diagnosis and the proper operation of a refrigerator. This course then continues with automatic defrost timers, system wiring, trouble diagnosis, wiring, charging, checking, performance checking and sizing of room air conditioners. Four credit hours.

HVA2211 RESIDENTIAL HEAT/AIR & COMMERCIAL ICE MAKERS THEORY

Provides an overview of gas, oil 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 & 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 wire, charge, test and troubleshoot heat pumps. Students install and start-up new systems at the job site of the homes in Ranken's RCDC program. Covers installation and sequence of the major manufacturers ice makers. Eight credit hours.

MAT2211 MAJOR APPLIANCE TECHNOLOGY THEORY

This course includes the instruction and practical application of the repair and service industry for electrical and gas appliances such as washers, dryers, ranges, microwave ovens, refrigerators and window air conditioners. Students will 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 will 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 setting. Five credit hours.

MAT2212 MAJOR APPLIANCE 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 mechanics 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.

ASSOCIATE OF APPLIED SCIENCE

Ranken is offering an Associate of Applied Science degree as a part of the evening program curriculum. You can earn your associate degree with a combination of Ranken's standard evening school courses as well as our new online courses. You can also transfer credit from other accredited technical training programs, or have your technical work experience evaluated for possible transfer credit. (30 technical credit hours required for graduation.)

For all General Education course requirements, please turn to page 89. For more information about the BSAM degree, please turn to page 92.

PROGRAM COURSES			Hours	Prerequisites
First Semester	HVA0110	Fundamentals of Refrigeration and Electricity	6	
Second Semester	HVA0120	Domestic Equipment Diagnosis and Repair	6	HVA0110 (Co. Req.)
Third Semester or	MAT0230	Laundry Appliances	6	HVA0110, HVA0120
Fourth Semester	MAT0240	Kitchen Appliances	6	HVA0110, HVA0120
Total technical credit hours for certificate completion			24	

COURSE DESCRIPTIONS

HVA0110 FUNDAMENTALS OF REFRIGERATION AND ELECTRICITY

Introduces trade principles and the basics of refrigeration, including a description of what is taking place inside each of the main parts of a system. Students learn to read a temperature pressure chart, apply it to systems using different refrigerants and evaluate the system using their gauges. The course covers soldering and brazing of copper tubing. Also covered are basic electrical principles in a theory/shop format. Students begin with the nature of electricity and progress to electrical safety, electrical values, generation of electricity, electrical circuits, electrical meters and wiring diagrams. Additionally, residential wiring and control circuits are covered. Six credit hours.

HVA0120 DOMESTIC EQUIPMENT DIAGNOSIS AND REPAIR

This course builds upon theories studied in the first semester. 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 and water heater service and installation. Emphasis is placed on electric and gas dryers, automatic washers, and gas, electric and heat pump water heaters. 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.

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 design, 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, domestic 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. Please see our AAS and BSAM evening program offerings starting on page 90.

PROGRAM COURSES		Hours	Prerequisites
First Semester	PLT1100 Plumbing Math	3	
	PLT1110 Introduction to Plumbing Drafting	2	
	PLT1111 Plumbing Theory I	5	
	PLT1112 Pipefitting and Basic Fixture Installation Shop	8	
Second Semester	PLT1200 Advanced Plumbing Drafting	5	All PLT1100 level courses
	PLT1211 Plumbing Theory II	5	All PLT1100 level courses
	PLT1212 Advanced Fixture Installation and System Design Shop	8	All PLT1100 level courses
	PLT1213 Boilers and Steam Theory	3	All PLT1100 level courses
	PLT1214 Basic Electrical Theory and Practical Application	2	All PLT1100 level courses
Total Technical Credit Hours Required		41	
GENERAL EDUCATION COURSES		Hours	Prerequisites
	COM1080 Technical Communications	3	
	CIT1110 Computer Literacy	2	
	WFD1200 Job Search Success	1	
Important Note: Only courses in which a grade of "C" or higher is earned may be applied toward this Ranken certificate. All students will be required to complete a math pre-course prior to the start of school. Information about the course may be obtained from the admissions office.			

COURSE DESCRIPTIONS

PLT1100 PLUMBING MATH

Consists of piping math and theory. Course covers theory topics like threads and threading equipment, steel pipe, copper, plastic and cast iron pipe and jointing methods. It also includes pipe fittings, fitting allowances and fitting makeups. Students learn conversion of length measurements, equal spacing, 45-degree offsets, parallel offsets, multiple offsets, offsets of various degrees and rolling offsets.

Students learn elevations and grades, water measurement, water pressure and head and formulas for solving problems with geometric shapes. Three credit hours.

PLT1110 INTRODUCTION TO PLUMBING DRAFTING

Covers the basics of plumbing drafting, which consists of the alphabet of lines, lettering, linework and arrows. It also includes orthographic projections, dimensioning, scale readings, plan views and isometric drawing construction. Two credit hours.

PLT1111 PLUMBING THEORY I

Provides a plumbing orientation, including history of the trade, safety, atmospheric pressure, traps, drainage, waste, vent systems, plumbing fixtures, plumbing appliances, storm drainage, private sewage disposal, plumbing systems inspections and tests and hot and cold water supply systems (public and private). It also covers heat loss calculations for sizing hydronic heating systems boilers and baseboards. Five credit hours.

PLT1112 PIPEFITTING AND BASIC FIXTURE INSTALLATION SHOP

Provides hands-on shop work to apply theories learned in PLT1111. Students start with basic pipefitting projects, including how to make pipe nipples and nipple chucks by hand and with power and how to assemble, measure and test steel, copper, plastic and cast iron pipes for watertightness. The class moves on to cover plumbing fixture installations. Students install wall-hung lavatories, water closets, bathtub installations, stack-vented bathroom groups, stack-vented kitchen sinks and all-fixture installations. Eight credit hours.

PLT1200 ADVANCED PLUMBING DRAFTING

Continues the study of plumbing drafting with advanced isometric drawings and diagrammatic plumbing drawings. Study includes pipe sizing according to the DFU method and drawing-in and sizing building drains, sewers, storm drains, downspouts, storm sewers and pipe elevations. Residential blueprints guide the students in drawing plumbing isometrics. Students size and create material lists for each drawing. Five credit hours.

PLT1211 PLUMBING THEORY II

Provides an overview of plumbing blueprint reading and surveying. Students learn how to interpret residential blueprints and plumbing symbols. They draw isometric piping diagrams from the floor plans, make material lists, figure grades and elevations from the plot plans and learn how to read rough-in sheets. Students also learn surveying layout of sewer trenches and building foundations. Incorporates in-class review for the National Occupational Competency Testing Institute outcomes assessments test. Five credit hours.

PLT1212 ADVANCED FIXTURE INSTALLATION AND SYSTEM DESIGN SHOP

Consists of advanced bathroom and kitchen design, rough-in and finish. Students work with three-fixture baths, including those with fixtures on the same wall and on opposite walls. Students install kitchen sinks with garbage disposals, dishwashers and water conditioning equipment. It also covers the installation of water heaters, laundry room fixtures, wall-hung water closets and urinals, sump pumps and hot water boilers as well as surveying fieldwork, shop restoration, clean-up and inventory. Eight credit hours.

PLT1213 BOILERS AND STEAM THEORY

Covers all aspects of steam, including its functions, its hazards and its safe use. Study includes types of boilers, boiler construction, boiler controls, safety devices, boiler room auxiliary equipment, water level controls and the expansion and contraction of pipe and pipe hangers. The course incorporates plant tours, videos and hands-on exposure to equipment and parts. Three credit hours.

PLT1214 BASIC ELECTRICAL THEORY AND PRACTICAL APPLICATION

Covers electrical safety, power tool safety, electrical terminology and the use of a meter to measure voltage, current and resistance. This course also covers different types of wire, wire sizing, wiring methods and problem solving with Ohm's law. Instruction is provided in sizing wire for leads, 120- and 240-volt circuits and proper grounding methods. Students explore single-phase and three-phase circuits, circuit breakers and fuses. Students will practice methods of stripping, splicing and terminating wires, install a receptacle and wall switch, tap an existing wire for an additional load and wire a garbage disposal and water heater. Two credit hours.

PLUMBING TECHNOLOGY (CONTINUED)

EVENING PROGRAM CERTIFICATE IN PLUMBING TECHNOLOGY

Evening students can earn a certificate in Plumbing Technology by pursuing this program that is customized to suit individual needs and interests.

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.

PROGRAM COURSES		Hours	Prerequisites
PLT0110	Pipefitting Theory and Practice	6	
PLT0100	Plumbing Systems Theory and Practice	6	
Total Technical Credit Hours for Certificate Completion		12	

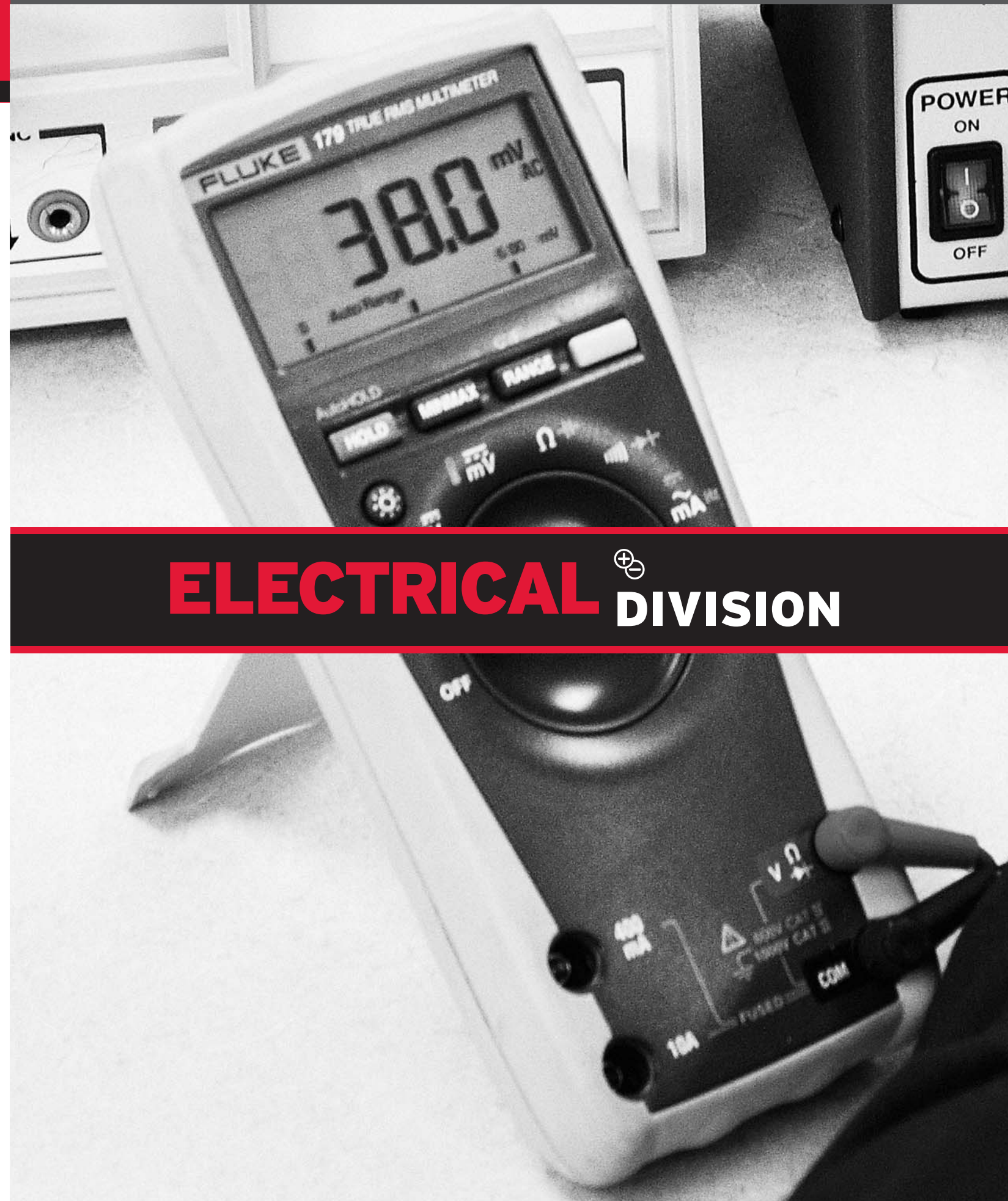
PLT0110 – PIPEFITTING THEORY AND PRACTICE

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 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.



ELECTRICAL  **DIVISION**