

ADVANCED CISCO CERTIFIED NETWORK PROFESSIONAL (CCNP) CERTIFICATION TRAINING

Advanced training for Cisco Certified Network Professional (CCNP) certification is now available at Ranken Technical College. Our convenient evening classes are designed to help you work toward the next level in your certification goals.

Ranken is not only a certified Cisco Networking Academy, but also the 2008 awardee of the prestigious Cisco "4R" award in the category of academic rigor.

The CCNP curriculum builds upon Cisco Certified Networking Associate (CCNA) courses, adding more complex network configurations, diagnosis and troubleshooting strategies. These courses are designed for individuals wishing to become network engineers, network administrators and network technicians.

Geared towards the working adult, classes are conveniently offered in the evening, meeting just twice a week, from 6:00 p.m. to 10:00 p.m.

Students may enroll in the CCNP program once they have successfully completed CCNA training within the Cisco Networking Academy or if they have a current CCNA certification.

Upon successful completion all of CCNP courses, students may wish to continue their education goals. Ranken offers a Bachelor of Science in Applied Management now, with an emphasis in Management Information Systems (MIS). In as little as 13 months you can earn your CCNP while concurrently earning credit hours toward your future degree.

PROGRAM COURSES		Hours	Prerequisites
CNT300C	Implementing Cisco IP Routing	6	
CNT310C	Implementing Cisco IP Switched Networks	6	
CNT320C	Troubleshooting and Maintaining Cisco IP Networks	6	
		18	

COURSE DESCRIPTIONS

CNT300C IMPLEMENTING CISCO IP ROUTING

In this course, students will learn how to configure EIGRP across HDLC, Frame Relay, MPLS, VPN and MPLS virtual circuits. Students will also configure OSPF over HDLC, Frame Relay, PPT and over different WAN links. Time will be spent implementing alternate routing path control, implementing IPv6, analyzing branch office network designs and planning installations; and analyzing designs to support mobile workers and planning network modifications. Six credit hours.

CNT310C IMPLEMENTING CISCO IP SWITCHED NETWORKS

This course covers the skills necessary to plan, configure and verify the implementation of complex enterprise switching solutions using Cisco's Campus Enterprise Architecture including, Secure integration of VLANs, WLANs, voice and video into campus networks. Six credit hours.

CNT320C TROUBLESHOOTING AND MAINTAINING CISCO IP NETWORKS

In this course, students will learn to plan and perform regular maintenance on complex enterprise routed and switched networks and use technology-based practices and a systematic ITIL-compliant approach to perform network troubleshooting. Six credit hours.



MANUFACTURING  DIVISION



INDUSTRIAL TECHNOLOGY

In today's highly complex society, technical industries and companies are being called upon to implement new technologies and equipment to improve efficiencies and maximize day-to-day operations. To minimize downtime and costly delays, companies are in need of qualified technicians capable of maintaining and repairing a wide variety of mechanical and electrical equipment. The Industrial Technology program offers comprehensive training in several of the most sought-after skills that companies are demanding as they seek employees with multi-craft talents.

Program graduates have expertise in a number of fields and are capable of stepping in and keeping equipment and machinery running in manufacturing plants, hotels or other mid-size or large companies. Recognized for their breadth of experience, they are qualified to solve most of the technical and industrial problems experienced by companies today. Additionally, our program prepares students for the EPA licensing exam covering refrigeration and air conditioning repair.

In addition to developing multiple skill sets, Industrial Technology graduates experience on-the-job diversity and increased flexibility in their career choices.

ASSOCIATE OF TECHNOLOGY, ASSOCIATE OF SCIENCE OR CERTIFICATE OF TECHNOLOGY

Ranken's Industrial Technology program provides overall instruction, hands-on training and experience in the practices and skills needed by

many facilities, including universities, hospitals, hotels and industrial businesses. The Industrial Technology program offers specialized instruction in the following areas:

- Basic electricity
- Introduction to Heating, Ventilation, Air Conditioning and Refrigeration (HVACR)
- Introduction to welding
- National Electrical Code, motor controls and Programmable Logic Controllers (PLCs)
- Basic pipefitting and plumbing
- Carpentry maintenance
- Hydraulics principles & theory
- Welding (TIG, MIG and SMAW)
- Mechanical systems

Students interested in completing the certificate of technology program will take all technical courses in the associate degree program and two general education courses per semester.

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.

- 73 INDUSTRIAL TECHNOLOGY
- 78 PHOTOVOLTAIC
- 79 PRECISION MACHINING TECHNOLOGY
- 83 FABRICATION AND WELDING TECHNOLOGY

PROGRAM COURSES			Hours	Prerequisites
INT113	Industrial Mechanical Systems Theory		5	
INT114	Industrial Mechanical Systems Shop		8	
INT121	Welding/Metal Fabrication & Hydraulics Theory		5	
INT122	Welding/Metal Fabrication & Hydraulics Shop		8	
INT211	Industrial Facilities Maintenance Theory		5	
INT212	Industrial Facilities Maintenance Shop		8	
INT201	Industrial Electrical/PLC Theory		5	
INT202	Industrial Electrical/PLC Shop		8	
Total Technical Credit Hours Required			52	

Automotive Division

Construction Division

Electrical Division

Information Technology Division

Manufacturing Division

General Education and Degree Options

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	MTH1110
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 Courses	MTH2220	Trigonometry	3	MTH2112
	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

INT1113 INDUSTRIAL MECHANICAL SYSTEMS THEORY

This course covers the basics of drill presses, band saws, and associated hand tools. Students will examine mechanical fasteners and torque, discuss the fundamentals of blueprints, symbols and terms specific to industrial mechanical systems. Students will identify basic components such as bearings seals and gaskets and analyze power transmission devices including gears, chains, belts, and couplings. Fluid transmission components including valves, black iron piping, and pumps will be covered as well as basic rigging, lifting, and equipment layout theories. Five credit hours.

INT1114 INDUSTRIAL MECHANICAL SYSTEMS SHOP

This course provides a hands-on application of all principles covered in INT1111, including basic mechanical hand tools and drill press operation, removal of frozen or damaged fasteners, and installation/troubleshooting of various power transmission devices. Students will employ written documentation skills as applied to the industry. The will also apply Preventative and Predictive Maintenance procedures to increase equipment life and plant efficiency. Students will also demonstrate proper procedures to secure, support, lift and place loads. Eight credit hours.

INT2111 WELDING/METAL FABRICATION AND HYDRAULICS THEORY

Introduces safety, the correct use of tools and the fundamentals of welding. Covers processes like Shield Metal Arc Welding (SMAW), Gas Metal Arc Welding (MIG/GMAW) and Gas Tungsten Arc Welding (TIG). Introduces oxy-fuel cutting and welding. Concludes with hydraulic fundamentals, principles and circuit analysis. Five credit hours.

INT2112 WELDING/METAL FABRICATION AND HYDRAULICS SHOP

Provides hands-on exposure to mild steel, aluminum and stainless steel materials through structured shop procedures and practices. Students use plumbing techniques to implement pumps, motors, cylinders, directional control valves, metering and check-and-flow control valves in working circuits during the hydraulic portion of the semester. They disassemble the components for inspection, repair or replacement and final test for proper operation. Eight credit hours.

INT2111 INDUSTRIAL FACILITIES MAINTENANCE THEORY

Provides a broad overview in three areas of study. Carpentry maintenance focuses on small construction projects, such as hanging drywall, hanging doors, suspended ceilings, concrete forms, basic surveying concepts and other building and grounds maintenance skills. Pipe fitting/plumbing maintenance includes the practical application of mathematics as well as the safe and proper use of hand and power tools used for soldering, brazing and PVC pipe and procedures used in the trade. The course also covers the mechanical refrigeration cycle, compressors and pressure temperature relationships. Five credit hours.

INT2112 INDUSTRIAL FACILITIES MAINTENANCE SHOP

Provides hands-on application of principles covered in INT2111, including basic carpentry projects that teach the student to measure, lay out and cut. Projects include the construction of an elevated wood and metal stud structure. Exposes students to drywall and taping, window and door installation and suspended ceiling grid and stair construction. Students assemble and install various copper and PVC pipe projects. RAH equipment is covered and students continue with the refrigeration cycle, pressure temperature relationships, BTU calculations and refrigerant controls. Eight credit hours.

INT2011 INDUSTRIAL ELECTRICAL/PLC THEORY

Begins with safety, basic electrical concepts and Ohm's law. Progresses through alternating current, lighting, motors, relays, starters, overload devices, ladder logic, HID lighting equipment, basic programmable logic controller (PLC) knowledge and three-phase electrical systems and services. Introduces three-phase motors and control circuits. National Electric Code (NEC) requirements wiring methods, box fill, conductor ampacity, de-rating calculations and conduit bending. Five credit hours.

INT2012 INDUSTRIAL ELECTRICAL/PLC SHOP

Provides hands-on application of principles covered in INT2211 including the installation of a circuit breaker panel, receptacle, switching and lighting circuits per the National Electric Code (NEC). Eight credit hours.

EVENING PROGRAM CERTIFICATE IN INDUSTRIAL TECHNOLOGY

Ranken evening program students can earn a certificate in Industrial Technology by pursuing a generalist program customized to suit individual needs and interests. These courses combine classroom and shop projects to provide overall instruction, hands-on training and experience in the practices and skills needed by area-wide facilities, including universities, hospitals, hotels and industrial businesses.

To earn a certificate in Industrial Technology, students must complete a minimum of four courses from the following:

- Blueprint Reading
- Electrical Maintenance
- Industrial Maintenance
- Stationary Engineering (license preparation)

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.

Stand-alone courses are also available in the following:

- Carpentry Maintenance
- Fabrication and Welding Technology
- Precision Machining Technology
- Plumbing Technology
- Heating, Ventilation, Air Conditioning and Refrigeration Technology
- Solar Photovoltaic Technology Training
- Home Inspection Training
- Home Energy Audit Training
- Locksmith Training

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
Blueprint Reading	BPRO100	Blueprint Reading	6
Electrical Maintenance	EMT0110	Electrical Maintenance I	6
	EMT0120	Electrical Maintenance II	6 EMT0110
Industrial Maintenance	INT0110	Industrial Maintenance Mechanics	6
	INT0100	Hydraulics, Millwright and Rigging	6
Stationary Engineering	STE0110	Stationary Engineering I	6
	STE0120	Stationary Engineering II	6
Total Technical Credit Hours for Certificate Completion		24	(minimum)

Important Note: Students may apply any or all courses from the programs listed above to total the 24 credits necessary to qualify for an Industrial Technology certificate. Electrical Maintenance, Industrial Maintenance and Stationary Engineering may be taken as one-year certificate programs.

COURSE DESCRIPTIONS

BLUEPRINT READING

BPRO100 BLUEPRINT READING

Presents the fundamentals of general blueprint reading, projection drawings, common terms and symbols. Students will learn to interpret blueprints and symbols in the machine trades, the building trades and welding. Six credit hours.

ELECTRICAL MAINTENANCE

EMT0110 ELECTRICAL MAINTENANCE I

Emphasizes electrical safety and proper use of tools as students cover the basics of electricity. The course provides an overview of series, parallel and combination circuits as well as electrical systems.

Students become familiar with both balanced and unbalanced systems. Introduces wiring methods including cable and conduit bending as well as surface metal raceway and flexible wiring systems. The course also covers standard switching circuits, basic service and feeder calculations, branch circuit requirements, along with an introduction to motor controls. Six credit hours.

EMT0120 ELECTRICAL MAINTENANCE II

Emphasizes maintenance and continued instruction of motor control circuits, ladder diagrams, control relays, motor starters and diagram reading. It also introduces students to troubleshooting PLCs. (Does not include programming of PLCs.) The installation of a three-phase transformer with panel board feeding balanced and unbalanced loads is also covered. Six credit hours.

INDUSTRIAL MAINTENANCE

INT0110 INDUSTRIAL MAINTENANCE MECHANICS

Includes instruction in math, basic terms, bearings, seals, industrial pumps, power transmission, power transmission components, brakes, clutches, use of V-belts and fasteners. Also covers basic pneumatics, compressors and compressed gas systems. Six credit hours.

INT0100 HYDRAULICS, MILLWRIGHT AND RIGGING

Includes instruction in the hydraulic transmission of force and energy, the operation of hydraulic pumps, hydraulic actuators, control of hydraulic energy through the use of pressure control valves, cylinders, directional control valves and flow control valves. The course also covers the millwright and rigging fundamentals of layout and leveling, ropes, knots, splices, wire rope, chins, weight calculations, CG cranes, hoists and ladders. Six credit hours.

STATIONARY ENGINEERING (LICENSE PREPARATION)

STE0110 STATIONARY ENGINEERING I

Covers boilers, including the construction of different styles, pressure capabilities, different ways of firing, safety devices and water level controls, including efficiencies, pollution, boiler auxiliaries such as feedwater heaters, softeners and feedwater treatment. Students tour an industrial boiler room and learn about pumps, both piston and centrifugal, methods of sizing, pressures and prime movers. Six credit hours.

STE0120 STATIONARY ENGINEERING II

Provides a history of steam engines over the last century with tours of steam engines still used today. Course covers the replacement of steam engines by turbines, how steam engines operate air compressors and how to maintain good compressed air as well as the basics of electricity and how to start and synchronize generators safely. The course will then focus on power generation, efficiency and how to obtain the most productivity from electrical equipment. Students will finish up the semester learning the basics of all industrial refrigeration with an emphasis on ammonia, efficiencies and safety. Six credit hours.

ADDITIONAL STAND-ALONE COURSES

SEG100C SOLAR PHOTOVOLTAIC (PV) TECHNOLOGY TRAINING

Students learn the basic types of the photovoltaic system and their applications for both stand-alone (battery backup) and utility interactive systems (grid tied). Students will learn the about PV system install, design, size calculations and installation safety. The student will be able to draw one-line electrical diagrams for interactive and stand-alone PV systems showing all major components and subsystems, and indicate the locations of the PV source and output circuits, inverter input and output circuits, charge controller and battery circuits. This course is taught in accordance with the NABCEP PV entry level learning

objectives and prepares students to take the NABCEP certification exam. At the end of the course, the student will be able to build a complete system from ground up. Lastly, the course covers the business side of the solar industry and helps the student understand what they need to know to run a solar business. Six credit hours.

INT101C HOME INSPECTION TRAINING

This course will teach students the fundamentals of inspecting structure, exteriors, roofing, electrical, plumbing, heating/cooling systems, insulation/ventilation systems, report writing and business development and marketing strategies. After completion of this course, students will be able to identify and properly document defects of a residential property within the standards of the industry. They will be able to properly document their findings on an inspection report. They will also learn essential skills in working with realtors, mortgage brokers, attorneys and financial institutions that play a key role in real estate transactions. Six credit hours.

INT102C HOME ENERGY AUDIT TRAINING

Energy audits have increased as the demand grows to lower expensive energy costs and move towards a sustainable future. There are tax credits from cities and the federal government for homeowners who implement recommendations made as a result of an energy audit. In this course you will learn the fundamentals of building science – thermodynamics, heat systems and transfer, moisture and humidity, airflow, insulation, thermal boundaries, R/U values, pressure boundaries, air sealing, blower door technology, ventilation, building calculations, combustion science and testing and energy conservation strategies. Six credit hours.

INT103C LOCKSMITH TRAINING

After completion of this course, students will be able to disassemble, repin and reassemble Kwikset, Schlage and import-type locks. They will also know how to drill a lock, know key identification, duplication, impression and key code generation, master keying, lock picking, and car opening. In addition to the technical elements of the program, students will understand the fundamentals of how to market and sustain a successful locksmith business. Whether students become part time or later become a full time locksmith, they will know the principles of operating a locksmith business. Six credit hours.

SOLAR ENERGY SYSTEMS AND GREEN TECHNOLOGY

EVENING PROGRAM CERTIFICATE IN SOLAR ENERGY SYSTEMS AND GREEN TECHNOLOGY

Solar energy programs provide the training graduates need to enter the rapidly emerging green technology fields. According to the U.S. Department of Energy, Photovoltaic (PV) technology is a young, growing high-tech industry that is going to create jobs and strengthen the economy.

PV makes use of the abundant energy of the sun and has little or no negative impact on our environment. It can be used in a wide range of products, from small consumer items to large commercial solar electric systems. Within the next ten years, PV electricity will be

competitive in price with traditional sources of electricity and will become widely utilized.

Evening students can earn a certificate in Solar Energy Systems and Green Technology by pursuing this program and learn how to work with this important new technology and help reduce the world's carbon footprint.

Prerequisite to the program is Electrical Maintenance I (EMT0110) or an equivalent course.

Each course may also be taken individually as a seminar.

PROGRAM COURSES		Hours	Prerequisites
EMT0110	Electrical Maintenance I (or equivalent)	6	
SEG100C	Solar Photovoltaic Technology Training	6	
Total technical credit hours for certificate completion		12	

COURSE DESCRIPTIONS

EMT0110 ELECTRICAL MAINTENANCE I

Emphasizes electrical safety and proper use of tools as students cover the basics of electricity. The course provides an overview of series, parallel and combination circuits as well as electrical systems. Students become familiar with both balanced and unbalanced systems. Introduces wiring methods including cable, MC, AC, NMC and conduit bending as well as surface metal raceway and flexible wiring systems. The course also covers standard switching circuits, basic service and feeder calculations, branch circuit requirements, along with an introduction to motor controls. Six credit hours.

SEG100C SOLAR PHOTOVOLTAIC (PV) TECHNOLOGY TRAINING

Students learn the basic types of the photovoltaic system and their applications for both stand-alone (battery backup) and utility interactive systems (grid tied). Students will learn the about PV system install, design, size calculations and installation safety. The student will be able to draw one-line electrical diagrams for interactive and stand-alone PV systems showing all major components and subsystems, and indicate the locations of the PV source and output circuits, inverter input and output circuits, charge controller and battery circuits. This course is taught in accordance with the NABCEP PV entry level learning objectives and prepares students to take the NABCEP certification exam. At the end of the course, the student will be able to build a complete system from ground up. Lastly, the course covers the business side of the solar industry and helps the student understand what they need to know to run a solar business. Six credit hours.

PRECISION MACHINING TECHNOLOGY

As new technologies continue to shape the manufacturing industry, companies are experiencing an immediate demand for machinists who are qualified to construct and maintain machines and equipment. Through Ranken's Precision Machining Technology (PMT) program, students receive training and hands-on instruction that emphasizes the design and construction of various operating components for machinery.

Ranken's Precision Machining Technology program provides a foundation for engineering and prepares students for employment in machining, Computerized Numerical Control (CNC) programming, inspection/quality control, maintenance and machine tool building.

The state-of-the-art Haas Technical Center and CAD/CAM computer lab offers students the experience necessary to advance on the job by learning the latest computerized machining technology. While the primary purpose of the program is training skilled, general machinists, students are also trained in various specialties, including CNC, Computer Aided Drafting (CAD)/Computer Aided Manufacturing (CAM), inspection and quality control, engineering design and maintenance machining.

Due to the rapid expanding use of sophisticated CNC machine tools, coupled with the demand for machinists generated by the local defense industry, the St. Louis area is experiencing a shortage in those trained in the latest technologies. Therefore, the employment outlook for PMT graduates continues to be exceptionally promising.

ASSOCIATE OF TECHNOLOGY, ASSOCIATE OF SCIENCE OR CERTIFICATE OF TECHNOLOGY

Throughout the two-year associate degree program, students will gain practical experience while programming and operating modern machinery in a well-equipped facility similar to those commonly found

in today's industry. The curriculum includes mechanical and computer design, dimensioning, blueprint reading and fundamental tool making, as well as hands-on experience in basic hand tools and shop technologies.

In addition, the program emphasizes the application of basic math principles in simulated shop situations. The program curriculum is comprised of various specialties, including:

- Computer Numerical Control (CNC) Programming
- Computer Aided Drafting (CAD)/Computer Aided Manufacturing (CAM)
- Inspection
- Maintenance Machining

By analyzing a company's end product, constructing the parts and maintaining various pieces of equipment on an ongoing basis, students are exposed to problem-solving skills and are trained to meet the machining needs of today's technical industries. Instruction occurs on the latest state-of-the-art equipment.

As a testament to industry support of this program, Ranken has one of the largest Haas Technical Centers in the region. Students are able to train on the state-of-the-art Haas CNC machines, giving them exposure to cutting edge technology.

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 or Second Semester	PMT1001	Introduction to Machining Theory	5	
	PMT1002	Introduction to Machining Lab	8	
	PMT1010	Mathematics for the Machine Trade	3	Co. Req. of Semester One Courses
First or Second Semester	PMT1011	Computer Numerical Control Theory	5	
	PMT1012	Computer Numerical Control Lab	8	
Third or Fourth Semester	PMT1021	CAD/CAM Theory	5	PMT1011
	PMT1022	CAD/CAM Lab	8	PMT1012
Third or Fourth Semester	PMT2001	Advanced Machining Theory	5	PMT1001
	PMT2002	Advanced Machining Lab	8	PMT1002
Total Technical Credit Hours Required			55	

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	MTH1110
Business/Information Technology	CIT1100	Computer Literacy	2	
	WFD1200	Job Search Success	1	MNG1220 or BUS1204 (Co. Req.)
Associate of Science	MNG1204	Introduction to Business and Management	3	ENG1099 (Co. Req.)
	MTH2112	College Algebra	3	MTH1100 or MTH1111
Additional Required Courses	MTH2220	Trigonometry	3	MTH2112
	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

PMT1001 INTRODUCTION TO MACHINING THEORY

Introduces students to an assortment of hand tools, measuring instruments and basic machine processes used in the machinist trade. Students will learn the safety and operation of machine tools such as a power saw, bench grinder, drill press and lathe, along with horizontal and vertical mills. Students learn to read and interpret blueprints in addition to planning the manufacturing process of a mechanical part. The course will also expose students to mathematical problems commonly used in the machinist trade, beginning with basic math and advancing through transposition of formulas, calculating speeds and feed rates, proportions and ratios and concluding with an introduction to trigonometry. Five credit hours.

PMT1002 INTRODUCTION TO MACHINING LAB

Introduces hand tools, measuring tools and layout procedures, then transitions into basic machine principals, including safety, operation and part set-ups for primary and secondary machining operations on conventional machines. Students learn to read and interpret blueprints, make calculations, build machine set-ups and manufacture mechanical parts using a drill press, power saw, lathe and vertical and horizontal milling machines. Also, includes the basic care and use of various measuring instruments commonly used in the machinist trade. Eight credit hours.

PMT1010 MATHEMATICS FOR THE MACHINE TRADE

This course introduces the student to the mathematics needed to succeed in the machine trade. It provides an understanding of mathematical concepts and their application to the machine trade – with real problems that the student will encounter in the industry. Students will solve problems that contain fractions and percentages, use customary (English) or metric units of measure, apply the fundamentals of algebra, plane geometry and trigonometry to everyday machining problems including, finding areas and volumes and solving machining problems that involve compound angles. Three credit hours.

PMT1011 COMPUTER NUMERICAL CONTROL THEORY

Introduces students to basic numerical control programming, then transitions into advanced programming of a CNC lathe, vertical and horizontal machining centers with 4th axis capabilities. The hardware associated with Computerized Numerical Control (CNC), the cartesian coordinate system and absolute/incremental programming formats are covered. Also, the use of computers to program, edit and graphically plot programs for mechanical parts will be included. Five credit hours.

PMT1012 COMPUTER NUMERICAL CONTROL LAB

Introduces the student to programming and operation of Computerized Numerical Control (CNC) machine tools. Provides hands-on experience programming, setting-up and operating CNC equipment. Students will be provided with a blueprint and will be responsible for programming and editing a part, choosing the correct tooling and fixturing, along with creating a set-up sheet document upon completion of the project. Eight credit hours.

PMT1021 CAD/CAM THEORY

Students learn Master Cam in order to create and manipulate 2D, surfaces and solid parts. They will use these parts to create tool paths to produce parts on Haas CNC (Computer Numerical Control) machines. The student will also learn the essentials of SolidWorks and will create parametric models of parts and assemblies they previously created using Master Cam. Five credit hours.

PMT1022 CAD/CAM LAB

Students will use CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing) to design, draw and produce a variety of parts using Haas CNC (Computer Numerical Control) equipment. Using Master Cam and Solid Works software, the students will learn how to draw 3D wire frame, surfaces and solid model parts. The students will also use Master Cam to develop the complex programs needed to produce a variety of parts on 3 and 4 axis Haas mills and 2 axis Haas lathes. The course will conclude with the student assembling the parts produced during the semester and creating a solid model of the finished assembly by using SolidWorks software. Eight credit hours.

PMT2001 ADVANCED MACHINING THEORY

The course begins with reviewing fundamental layout tools, measuring instruments, machine set-ups and machining processes. It then transitions into advanced machining processes of intricate parts which require custom fixturing and complex set-ups. In the tool and die/ mold making portion of this course, the students will learn the function and terminology of a stamping die and the molding process. Students will learn the theory of heat treating along with the grinding process required to manufacture a precision machine part. Five credit hours.

PMT2002 ADVANCED MACHINING LAB

Students apply their machining skills and technical knowledge in order to manufacture a complex mechanical part to blueprint tolerance specifications on conventional machines found in a machine shop. Participating in a team manufacturing project, they will work in small groups designing, problem solving and manufacturing a product that replicates common practices found in prototype part development. Students will use advanced inspection equipment including a Coordinate Measurement Machine and an Optical Comparator to verify the dimensions of the finished parts. Eight credit hours.

EVENING PROGRAM CERTIFICATE IN PRECISION MACHINING TECHNOLOGY

This machinist-level program consists of machining, metal processing theory, mathematics, blueprint reading, Computerized Numerical Control (CNC) programming and Computer Aided Drafting/Computer Aided Manufacturing (CAD/CAM). The primary goal of the program is to develop fundamental machining skills on milling machines and lathes.

Sections can be taken as stand alone sections or combined for a two-year certificate. In order to receive the certificate, students must complete Engine Lathe Fundamentals, Milling Machine Fundamentals and CNC Programming sections; plus either an advanced machining or CAD/CAM section.

The CAD/CAM section focuses on topics such as advanced computer literacy for the programmer, fundamentals of two-dimensional and three-dimensional drafting and programming with the latest state-of-the-art software.

These classes meet 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
Section One	PMT0111	Engine Lathe Fundamentals	6	
Section Two	PMT0113	Milling Machine Fundamentals	6	
Section Three	PMT0211	Advanced Machining	6	PMT0111 and PMT0113
Section Four	PMT0213	CNC Programming	6	PMT0113
Section Five	PMT0224	CAD/CAM	6	PMT0213

COURSE DESCRIPTIONS

PMT0111 ENGINE LATHE FUNDAMENTALS

The student will concentrate on the manual lathe. They will learn turning, threading, taper turning and drilling operations. Students will learn setups such as, between centers, three jaw chucks and four jaw chucks. They will also have lessons on basic right angle trigonometry, print reading, drill presses, saws and lay-out. Six credit hours.

PMT0113 MILLING MACHINE FUNDAMENTALS

The student will concentrate on the vertical milling machine. They will learn the set-up and operations of a mill. Students will also have lessons on basic right angle trigonometry, print reading, drill presses, saws and lay-out. Six credit hours.

PMT0211 ADVANCED MACHINING

Students will be using lathes, mills and surface grinders. The projects involve assembly and tooling used in industry. Trigonometry, carbide tooling and grinding will also be covered. Six credit hours.

PMT0213 CNC PROGRAMMING

Students will learn basic CNC programming, including G and M codes, unique codes and thread milling. The course also covers the CNC lathe and students will learn how to set-up and operate Haas CNC machine tools. Six credit hours.

PMT0224 CAD/CAM

Students will begin by learning Master Cam software in order to draw blueprints with the aid of a computer. These basic drawing skills will develop into drawing 3D wire frame and solid model parts. The mill and lathe CAM instruction will be used to generate programs and machine finished parts. Six credit hours.

Due to high demand, Ranken is offering a Fabrication and Welding Technology program in a brand new state-of-the-art facility. The curriculum includes oxy-fuel cutting, Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW) and Gas Tungsten Arc Welding (GTAW). The theory for each of these processes is discussed along with proper joint design and proper welding techniques.

Blueprint reading and welding symbol interpretation are practiced throughout the course. The welding is done on plate and pipe on low carbon steel, stainless steel and aluminum. Several certification tests are offered in SMAW, GMAW and GTAW.

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 on page 90.

PROGRAM COURSES			Hours	Prerequisites
First Semester	FWL1100	Fundamentals of Welding Technology	12	
	FWL1110	Blueprint Reading and Quality Inspection	3	
Second Semester	FWL1200	Welding Fabrication	12	
	FWL1210	Fabrication Equipment Technology	3	
Total Technical Credit Hours Required			30	

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.

COURSE DESCRIPTIONS

FWL1100 FUNDAMENTALS OF WELDING TECHNOLOGY

Introduces students to welding and cutting processes in both theory and shop. The course provides an overview of various techniques, including Shield Metal Arc Welding (SMAW), Flux Cored Arc Welding (FCAW), Gas Metal Arc Welding (MIG/GMAW) and Gas Tungsten Arc Welding (TIG/GTAW) to be applied on various metals. The emphasis is to develop proper welding techniques in all positions. Students will also learn the procedures for preparing materials using oxy-fuel cutting and carbon arc gouging. By the end of the course, students will be prepared for the American Welding Society (AWS) certification test and vertical SMAW, MIG/GMAW and FCAW on steel plates. Twelve credit hours.

FWL1110 BLUEPRINT READING AND QUALITY INSPECTION

Offers an in-depth study of blueprint reading, students will have a complete understanding of typical weld symbols and the blueprints used throughout the welding industry, as well as, basic weld inspection. Three credit hours.

FWL1200 WELDING FABRICATION

Students lay out, fit and fabricate metal components to structural forms, as used to manufacture machinery frames, such as bridge parts and custom race car frames. Students will learn the necessary setup and operation of equipment used in chassis and the structural steel fabrication industry. Students will use blueprints to fabricate parts that are commonly found in both the structural steel and chassis fabrication industries. Twelve credit hours.

FWL1210 FABRICATION EQUIPMENT TECHNOLOGY

The setup and operation of equipment used in structural steel and chassis fabrication industries; students learn how to operate machinery such as a Computer Numerical Controlled (CNC) cutting table, iron worker, pipe coping, pipe bending and other metal working equipment. Three credit hours.

EVENING PROGRAM CERTIFICATE IN FABRICATION AND WELDING

The evening program curriculum for Fabrication and Welding includes oxy-fuel cutting, Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Gas Tungsten Arc Welding (GTAW), Flux Cored Arc Welding (FCAW). The theory for each of these processes is discussed along with proper joint design and proper welding techniques.

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 on page 90.

PROGRAM COURSES		Hours	Prerequisites
FWL0110	Welding I	6	
FWL0120	Welding II	6	FWL0110 (Co. Req.)
Above two courses are required plus one of the following:			
FWL0231	Advanced Gas Tungsten Arc Welding (GTAW/TIG)	6	FWL0110
FWL0230	Advanced Shielded Metal Arc Welding (SMAW/Stick)	6	FWL0110, FWL0120
FWL0121	Advanced Gas Metal Arc Welding (GMAW/MIG) and Flux Cored Arc Welding (FCAW)	6	FWL0110
FWL0111	Welding Inspection and Print Reading	6	
FWL0122	Structural Fabrication	6	FWL0110
FWL0123	Chassis Fabrication	6	FWL0110
FWL0112	CNC Cutting/Blueprint Reading	6	
Total Technical Credit Hours for Certificate Completion		18	

COURSE DESCRIPTIONS

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 (GTAW), 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.

FWL0120 WELDING II

Focuses on the skills required to perform welds in various positions. Students will be prepared for the AWS certification test in vertical Shield Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW) on steel plate. Six credit hours.

FWL0231 ADVANCED GAS TUNGSTEN ARC WELDING (GTAW/TIG)

Covers Advanced Gas Tungsten Arc Welding (GTAW/TIG) welding processes by using mild steel, stainless steel and aluminum in all positions. Students will also learn to weld on pipe using the GTAW/TIG process. Six credit hours.

FWL0230 ADVANCED SHIELDED METAL ARC WELDING (SMAW/STICK)

Focuses on the skills for stick welding mild steel pipe in various positions. Students will be prepared to receive a certification in pipe welding. Six credit hours.

FWL0121 ADVANCED GAS METAL ARC WELDING (GMAW/MIG) AND FLUX CORED ARC WELDING (FCAW)

Develop advanced skills in the Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW) processes. Students will learn to weld by completing projects, including pipe welding. Six credit hours.

FWL0111 WELDING INSPECTION AND PRINT READING

Offers an in-depth study of blueprint reading and the ability to interpret shop drawings. Students will be introduced to different types of welding inspection and inspection principles, as well as the metallurgy related to welding. Six credit hours.

FWL0122 STRUCTURAL FABRICATION

Focusing on fabricating and the cutting and welding of components in the structural steel fabrication field. Students will learn the necessary setup and operation of equipment used in the industry. They will also learn to fabricate parts by using blueprint formats. Six credit hours.

FWL0123 CHASSIS FABRICATION

This course focuses on the ability to cut, weld and fabricate components in the race car chassis field. Students will learn the setup and operation of equipment used in the industry. They will also learn to fabricate parts using blueprint formats. Six credit hours.

FWL0112 CNC CUTTING/BLEUPRINT READING

Covers the programming, set up and operation of a plasma cutting table. Students are also prepared in advanced blueprint reading and drawing interpretation. Six credit hours.



GENERAL EDUCATION AND DEGREE OPTIONS

