19 » automotive collision repair technology
23 » automotive maintenance technology
27 » fleet management
28 » high performance racing technology
The Automotive Collision Repair Technology program operates in 20,000 square feet of shop space devoted exclusively to student training utilizing the Inter-Industry Conference on Automotive Collision Repair (I-CAR) Enhanced Delivery Curriculum.

In this real-world setting, students repair late model collision-damaged vehicles with modern equipment such as frame machines, computerized electronic measuring systems, mig welders, a resistance welder, downdraft spray booths, prep stations, spot welding equipment and a Hunter four-wheel computerized alignment machine.

After returning vehicles to pre-accident condition, they are either sold or driven by Ranken administration and faculty.

The program is certified in all four areas by the National Institute for Automotive Service Excellence (ASE) and the National Automotive Technicians Education Foundation (NATEF) in all four areas of auto body repair: Non-Structural, Structural, Refinishing and Mechanical/Electrical.

ASSOCIATE OF TECHNOLOGY, ASSOCIATE OF SCIENCE OR CERTIFICATE OF TECHNOLOGY

Based on the tasks established by ASE/NATEF and I-CAR, this two-year program provides students with skills to restore collision damaged vehicles to industry standards. The importance of certification and training continues to increase in the industry among collision repair facilities and insurance companies. In response to this demand, a graduate of the program has the potential to receive 70 I-CAR Gold Points and four ASE certifications. Graduates may also qualify for a Sikkens certification.

Program graduates are trained in:
- Unibody and full frame damage analysis
- Writing estimates manually and electronically
- Making non-structural repairs in metal and plastics
- Performing welding and cutting operations in steel and aluminum
- Straightening structural steel and aluminum
- Replacement of structural components
- Steering and suspension repair and alignments
- Air conditioning systems relating to collision damage
- Diagnosing electrical and electronic problems
- Refinishing systems and the processes to restore the original finish to industry standards

Upon completing the program, graduates are qualified for positions as collision repair technicians and automotive refinish technicians, with the option to pursue careers in management, estimating and sales.

Students interested in earning the certificate of technology will take all Automotive Collision Repair Technology courses and three 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.

<table>
<thead>
<tr>
<th>PROGRAM COURSES</th>
<th>Hours</th>
<th>Prerequisites</th>
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<td>Total technical credit hours required</td>
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AUTOMOTIVE 
- associate of technology 
- associate of science 
- certificate of technology

» automotive collision repair technology

<table>
<thead>
<tr>
<th>COURSE DESCRIPTIONS</th>
<th>Hours</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td><strong>ACR1110 Fundamentals of Collision Repair and Straightening Steel Theory</strong> Covers worker protection and personnel safety relative to the collision repair industry. The course emphasizes vehicle identification, estimating systems and terminology used in the collision repair process. Students will learn how to properly analyze frontal, side and rear impacts along with performing a mechanical systems analysis. This section also covers basic cosmetic straightening of steel and body filler applications. Three credit hours.</td>
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<tr>
<td><strong>ACR1120 Fundamentals of Collision Repair and Straightening Steel Shop</strong> Emphasizes application of principles studied in ACR1110 to hands-on shop work. Four credit hours.</td>
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<tr>
<td><strong>ACR1130 Non-Structural Analysis and Damage Repair Theory</strong> Offers instruction in the replacement of mechanically fastened, welded and adhesively bonded panels. Provides an in-depth study of plastic repair methods using welding and adhesives. An overview of trim and hardware used in today’s vehicles is discussed, along with movable and stationary glass. Three credit hours.</td>
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<tr>
<td><strong>ACR1140 Non-Structural Analysis and Damage Repair Shop</strong> Emphasizes application of principles studied in ACR1130 to hands-on shop work. Four credit hours.</td>
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<tr>
<td><strong>ACR1210 Welding and Cutting Steel/Aluminum Theory</strong> Introduces the Steel GMA (MIG) welding process, preparing the students for the I-CAR Automotive Steel Mig Welding qualification test. An overview of the oxyacetylene/plasma cutting process is covered along with a section on aluminum welding used in repairing today's modern vehicles. This section prepares the student for the Automotive Aluminum GMA Welding Qualification Test. Includes a study of restraint systems and advanced application of movable and stationary glass. Three credit hours.</td>
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<tr>
<td><strong>ACR1220 Welding and Cutting Steel/Aluminum Shop</strong> Emphasizes application of principles studied in ACR1210 to hands-on shop work. Four credit hours.</td>
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<tr>
<td><strong>ACR1230 Structural Analysis and Damage Repair Theory</strong> Introduces measuring procedures and how they relate to structural repairs. Provides detailed instructions on structural straightening of steel and aluminum materials along with the replacement of aluminum panels. Three credit hours.</td>
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</tbody>
</table>
» automotive collision repair technology

ACR1240 Structural Analysis and Damage Repair Shop
Emphasizes application of principles studied in ACR1230 to hands-on shop work. Four credit hours.

ACR2110 Mechanical and Electrical Components 1 Theory
Covers tires, wheels, suspensions and steering systems. An in-depth study is done on wheel alignment and diagnostic angles. This information is critical for performing alignments in a shop environment. This course also introduces basic electrical theory. Three credit hours.

ACR2120 Mechanical and Electrical Components 1 Shop
Emphasizes application of principles studied in ACR2110 to hands-on shop work. Four credit hours.

ACR2130 Mechanical and Electrical Components 2 Theory
Incorporates information on diagnosis and testing of electrical systems. Advanced electrical systems are covered including lighting, starting and charging systems and power accessories. Brake systems are covered, with discussions on anti-lock brakes and traction control systems. Drive trains are also discussed along with fuel, exhaust and emissions systems. Three credit hours.

ACR2140 Mechanical and Electrical Components 2 Shop
Emphasizes application of principles studied in ACR2130 to hands-on shop work. Four credit hours.

ACR2210 Painting and Refinishing 1 Theory
Covers in detail the equipment needed to refinish vehicles with today's paint technology. An overview of V.O.C. regulations and personal/refinishing safety is presented. Proper surface preparation along with proper masking techniques are discussed. Emphasis is placed on the importance of proper undercoat systems. Three credit hours.

ACR2220 Painting and Refinishing 1 Shop
Emphasizes application of principles studied in ACR2210 to hands-on shop work. Four credit hours.

ACR2230 Painting and Refinishing 2 Theory
Presentations on color theory and how it relates to the refinishing world. Discussions on the application and blending of waterborne basecoat/clearcoat and tri-coat paint systems. Refinishing of plastics is discussed along with programs on paint tinting and detailing. Three credit hours.

ACR2240 Painting and Refinishing 2 Shop
Emphasizes application of principles studied in ACR2230 to hands-on shop work. Four credit hours.
automotive collision repair technology

EVENING PROGRAM CERTIFICATE IN AUTOMOTIVE COLLISION REPAIR

The Automotive Collision Repair Technology program operates in 20,000 square feet of shop space devoted exclusively to student training on current model vehicles with collision damage. In this real-world setting, students use modern equipment such as three types of electronic measuring systems, body and frame machines, downdraft spray booths, computerized mixing systems, prep stations, MIG welders and a resistant spot welder. The department utilizes the Inter-Industry Conference on Automotive Collision Repair (I-CAR) Enhanced Delivery Curriculum and is NATEF certified in all four areas.

The following sections are stand-alone and can be taken in any sequence. These classes usually meet on 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

<table>
<thead>
<tr>
<th>Section One</th>
<th>ACR0110</th>
<th>Non-Structural Repair</th>
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<td>Section Two</td>
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<td>Section Four</td>
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<td>Mechanical</td>
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The following sections are stand-alone and can be taken in any sequence. These classes usually meet on Tuesdays and Thursdays from 6:00 p.m. to 9:30 p.m.

Total technical credit hours for certificate completion 24

COURSE DESCRIPTIONS

ACR0110 Non-Structural Repair

This course offers a general overview of repair procedures, surface preparation, straightening minor damage and applying plastic filler. Also included are plastic identification and repair procedures, panel replacement and alignment. In addition, theory and application of welding procedures when replacing non-structural and structural parts will also be covered. The emphasis of the class is prepping and passing the I-CAR MIG Welding Qualification Test. Six credit hours.

ACR0111 Refinishing

This course teaches students to use refinish equipment, understand and apply the proper undercoat system, determine areas to be refinished, methods of sanding and applying waterborne BC/CC paint system. Also included are blending waterborne BC/CC along with removing minor imperfections. The theory and practice involved in the application of tri-coat paint systems, color tinting and plastic refinishing is also covered. Six credit hours.

ACR0112 Structural

This course covers the theory and practical applications involved in measuring systems, diagnosing unibody damage and comprehending specification manuals. Students are also given instruction on collision theory, structural damage analysis skills and correction procedures on unibody and bodyover-frame vehicles. Six credit hours.

ACR0113 Mechanical Collision Repair

This course covers the theory of steering and suspension as it relates to a collision. Students will learn different types of suspensions and their components along with performing four wheel alignments. Emphasis is placed on understanding all alignment angles; this will enable a student to help diagnose damage to the vehicle’s structure and suspension parts. This course examines electrical circuit types and circuit theory. Included is discussion of parallel and series circuits and how voltage, amperage and resistance affect each other. Students will understand the theory of automotive air conditioning systems using 134a refrigerants. Both the function and the design of various restraint systems, including seat belts, seat belt tensioners and air bags will be discussed. Students will perform common collision related diagnosis and repairs in these areas. Six credit hours.
automotive maintenance technology

As technology and electronics continue to influence the automotive industry, many of St. Louis’ largest car manufacturers, dealerships and repair shops are in need of skilled technicians capable of solving new and complex problems.

To meet this need, Ranken offers an Automotive Maintenance Technology (AMT) program that provides students with the comprehensive knowledge and skills required by leading automotive manufacturers and factories today.

Known for its high standards, the Chicago Pneumatic Tool Company and Babcox Publishing recognized Ranken as one of the top 20 automotive programs in its 2009 National School of the Year Contest. Additionally, our students regularly compete and win top honors at the local, state and district levels of the SkillsUSA (formerly VICA) competition.

ASSOCIATE OF TECHNOLOGY, ASSOCIATE OF SCIENCE OR CERTIFICATE OF TECHNOLOGY

Ranken’s AMT program provides students with two years of hands-on training and instruction in diagnosing and repairing automotive problems and malfunctions. Combining traditional and modern industry practices, the program develops student proficiencies in the following areas:

» Engine repair
» Automatic transmission/transaxle
» Manual drivetrain and axles
» Suspension and steering
» Brakes
» Electrical/electronic systems
» Heating and air conditioning
» Engine performance

During the last 40 days of the program, students will gain real-world experience as they participate in an on-site automotive practicum in which they will service and repair customer vehicles.

For students interested in employment with the region’s leading auto manufacturers, Ranken currently offers an Import Maintenance Technology program. All of the training will be focused on import training and curriculum. The program incorporates hands-on training and on-the-job experience at a sponsoring import dealer. Under the supervision of a mentor technician with Toyota T-TEN/Honda PACT programs, students complete a professional internship in a dealership or repair shop during their final semester.

Students who wish to pursue a high performance option may do so at the end of their third 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.

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<tr>
<th>PROGRAM COURSES</th>
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<tr>
<td>AMT/GMT2222</td>
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</table>

Total technical credit hours required 63
COURSE DESCRIPTIONS

AMT1101 Auto Electricity Theory
Covers the theory and application of the fundamentals of automotive electrical and electronics systems, including basic electrical/electronics theory testing and servicing. The course details automotive systems such as batteries, cranking motors and their control circuits, charging systems (alternators, mechanical and electronic regulators), chassis wiring diagnosis and repair and gauges (mechanical and electronic). Three credit hours.

AMT1102 Auto Electricity Shop
Hands-on application of AMT1101 in a shop setting. Four credit hours.

AMT1110 Engines Theory
Students are introduced to the internal combustion engine, both gasoline and diesel; including component operation, diagnosis and service, removal, disassembly and measurement of components, reassembly, installation and adjustments. Three credit hours.

AMT1120 Engines Shop
Hands-on application of AMT1110 in a shop setting. Four credit hours.

AMT/GMT1201 Advanced Electricity/AC Theory
Emphasizes the theory and application of advanced electronics, including ignitions systems (electronic waste spark and coil-on plug), accessories, supplemental restraint systems, computer networking, computer communications and computer sensory systems. Students get an overview of A/C fundamentals, including system diagnosis, repair of manual and automotive heating ventilation and air conditioning systems. Three credit hours.

AMT/GMT1202 Advanced Electricity/AC Shop
Hands-on application of AMT/GMT1201 in a shop setting. Four credit hours.

AMT/GMT1221 Suspension and Steering Theory
Covers the diagnosis, service, repair and adjustment of chassis components, including front and rear suspension systems, manual and power steering, wheel alignments, tire and wheel balancing and the latest on tire pressure monitoring systems. Three credit hours.

AMT/GMT1222 Suspension and Steering Shop
Hands-on application of AMT/GMT1221 in a shop setting. Four credit hours.
» automotive maintenance technology

**AMT/GMT2101 Brakes and Driveline Theory**
Covers the diagnosis, service, repair and adjustment of drive axles, including limited slip differentials and axle shafts. Students learn brake systems, including drum and disc systems, hydraulic systems, power assist systems, drum and rotor machining, antilock and traction control systems. Three credit hours.

**AMT/GMT2102 Brakes and Driveline Shop**
Hands-on application of AMT/GMT2101 in a shop setting. Four credit hours.

**AMT/GMT2121 Automotive Drivetrain Theory**
Covers the diagnosis, service, repair and adjustment of automatic transmissions, manual transmissions and four- and all-wheel drive transfer cases. Includes the diagnosis and service procedures of U-joints and constant velocity joints. Three credit hours.

**AMT/GMT2122 Automatic Drivetrain Shop**
Hands-on application of AMT/GMT2121 in a shop setting. Four credit hours.

**AMT/GMT2201 Engine Performance Theory**
Covers the diagnosis, service, repair and adjustment of computerized EFI systems as well as OBD II applications, including emission control devices (ignition control, EGR valves, catalytic converter, etc.) The course incorporates advanced diagnosis of engines, fuel systems, ignition systems, emissions and computer-controlled systems. Students will also learn to run an OBD II drive trace and to test drivability problems using a chassis dyno. Three credit hours.

**AMT/GMT2202 Engine Performance Shop**
Hands-on application of AMT/GMT2201 in a shop setting. Four credit hours.

**AMT2203 Automotive Line**
Hands-on application of all automotive areas in an actual shop atmosphere with service and repair of customer vehicles, including training in service writing and parts techniques. Seven credit hours.

**AMT/GMT2222 Automotive Professional Internship**
Incorporates on-the-job experience at a sponsoring dealer under the supervision of a mentor technician selected by the sponsoring dealer. The dealership service manager and the Ranken coordinator evaluate this internship. Seven credit hours.
EVENING PROGRAM CERTIFICATE IN AUTOMOTIVE MAINTENANCE TECHNOLOGY
This curriculum emphasizes the most modern diagnostic equipment in the automotive maintenance field. Upon completion of the instruction and hands-on experience in diagnosing and repairing automotive problems and malfunctions, students are prepared to enter the job market as entry-level technicians.

The program develops student proficiencies in the following areas:
» Engine repair
» Automatic transmission/transaxle
» Manual drivetrain and axles
» Suspension, steering and brakes
» Electrical/electronic systems
» Heating and air conditioning
» Engine performance

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

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<tr>
<td>First Semester</td>
<td>AMT0110 Engines and Automotive Electricity</td>
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<td>Second Semester</td>
<td>AMT0120 Computer Electronics and Computer Controls</td>
<td>6 AMT0110</td>
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<td>Third Semester</td>
<td>AMT0230 Brakes/Vehicle Systems and Suspensions</td>
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<td>Fourth Semester</td>
<td>AMT0240 Clutches/Manual Transmissions and Automatic Transmissions</td>
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<td>Total technical credit hours for certificate completion</td>
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COURSE DESCRIPTIONS

AMT0110 Engines and Automotive Electricity
Instruction begins with engine foundation, that provides a detailed study of internal combustion engines, including the theory of operation and basic adjustments. Instruction includes disassembly, component study, component measurement, reassembly and how to make the appropriate mechanical adjustments on an automotive engine. The second half of the semester students will focus on electrical foundations and cover the theory of Parallel/Serial circuits, Ohms law, DVOM testing and servicing of various electrical components. Electrical systems that will be covered include automotive batteries, starters, charging systems, interior/ exterior lighting and accessories. Six credit hours.

AMT0120 Computer Electronics and Computer Controls
The semester begins with automotive body electronics including the theory and operation of automotive accessories and automotive air conditioning systems, including both R-12 and R134a refrigerants. Hands-on diagnosis and repair of refrigerant systems are practiced in the shop. The second part of the semester covers the principles of operation, diagnosis and service of computer controlled engines and OBD II technology. The hands-on emphasis includes diagnosis of computer circuitry with a digital automotive scope and various types of scan tools. Computer-related drivability troubleshooting is featured during this course. Six credit hours.
» automotive maintenance technology

AMT0230 Brakes/Steering Suspension Systems
Instruction begins with a comprehensive overview of vehicle brake systems, including brake foundations, disc and drum, hydraulics and electronic antilock braking systems. An in-shop emphasis focuses on the hands-on repair of braking systems, including rotor/drum reconditioning. This course also covers vehicle chassis systems. The curriculum will address steering systems, front suspension systems, tire and wheel construction and balance and wheel alignment, including two and four wheel adjustments. The theory section incorporates a comprehensive study of vehicular chassis systems in current operation. Six credit hours.

AMT0240 Clutches/Manual Transmissions and Automatic Transmissions
This course starts with the basic principles of operation for clutches, differentials, manual transmissions and transaxles. The course includes hands-on disassembly, evaluation and reassembly of rear wheel drive differentials, limited slip carriers, transfer cases, rear wheel drive transmissions, transaxles, Constant Velocity (C.V.), driveshafts and clutches. This course finishes up the semester covering automatic transmissions and automatic transaxles commonly used today. Students learn torque converters, planetary gearing, clutches, bands, electronic controls and hydraulic circuitry. The emphasis of this course is the disassembly, evaluation and reassembly of several currently used transmissions and transaxles. Six credit hours.

» fleet management

EVENING PROGRAM CERTIFICATE IN FLEET MANAGEMENT
Companies with large fleets of vehicles need qualified automotive experts to manage those fleets. Local companies like Ameren and Enterprise as well as St. Louis City and St. Louis County and many local police departments all need fleet managers. Students can now take our new NAFA - www.nafa.org - approved training classes to become a Certified Automotive Fleet Manager (CAFM) or Certified Automotive Fleet Supervisor (CAFS).

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<tr>
<th>PROGRAM COURSES</th>
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<td>MNG3010 Professional Skills Development</td>
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<td>MNG3011 Vehicle Maintenance Management</td>
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<td>MNG3012 Risk and Asset Management</td>
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<tr>
<td>MNG3013 Business Management</td>
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MNG3010 Professional Skills Development
This course focuses on leadership skills and development of professional expertise to allow fleet managers and supervisors to continuously educate themselves to stay ahead of the pack. It also provides fleet managers with the tools they need to function in a data-rich, information poor work environment by giving students a general knowledge of Information Technology which will help them to solve problems and enhance IT functionality. Three credit hours.

MNG3011 Vehicle Maintenance Management
Vehicle maintenance directly impacts productivity, driver satisfaction, corporate image, safety, environmental compliance and the financial bottom line. The competencies in this course help students gain an understanding of essential maintenance principals to manage in-house or outsourced maintenance personnel and drivers. The VMM course also deals with both conventional and alternative fuels in centralized and decentralized operations. Three credit hours.

MNG3012 Risk and Asset Management
This course focuses on the responsibilities involved with the selection, procurement, use, care and disposal of fleet vehicle and equipment assets. It also deals with planning and decision making dealing with uncertain events as well as controlling risks before they can become a problem in addition to strategies for dealing with loss. The competencies will demonstrate the varying strategies of dealing with risk by focusing on insurance, subrogation, training and safety in addition to how to effectively handle a loss. Three credit hours.

MNG3013 Business Management
This course focuses on an organization’s rights, boundaries and responsibilities when dealing with leasing companies, automobile dealers, supply or service contractors and insurance companies. Other competencies covered include financial analysis of various acquisition options, ability to conduct a lifecycle analysis, basic accounting principles, benchmarking, outsourcing decisions and preparing and implementing a fleet budget. Three credit hours.
The High Performance Racing Technology (HPRT) program adds the excitement of aftermarket engine performance improvement to our standard automotive technician training. Our specialized training allows students to design and build any type of high performance engine using a wide variety of aftermarket engine components and control systems and tune it for maximum output and drivability using various data acquisition tools and dynamometers.

In order to gain a foundation of mechanical repair, students in the HPRT program will share basic automotive repair courses with the Automotive Maintenance Technology (AMT) program. Upon completion of these courses, students will focus on two areas of emphasis, engines and tuning.

Because students are typically required to complete the AMT program prior to beginning HPRT courses, Ranken is now offering a Fast Track course designed for the HPRT student who would like to start high performance training on the first day of class. The Fast Track program is held during the summer in Ranken’s state-of-the-art, air conditioned HPRT facilities.

**PROGRAM COURSES**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMT1101 Auto Electricity Theory</td>
<td>3</td>
<td></td>
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<tr>
<td>AMT1102 Auto Electricity Shop</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>AMT1110 Engines Theory</td>
<td>3</td>
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<tr>
<td>AMT1120 Engines Shop</td>
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<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tr>
<td>AMT/MIT1201 Advanced Electricity/AC Theory</td>
<td>3</td>
<td>AMT1101</td>
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<tr>
<td>AMT/MIT1202 Advanced Electricity/AC Shop</td>
<td>4</td>
<td>AMT1102</td>
</tr>
<tr>
<td>AMT/MIT1221 Suspension and Steering Theory</td>
<td>3</td>
<td>AMT1101</td>
</tr>
<tr>
<td>AMT/MIT1222 Suspension and Steering Shop</td>
<td>4</td>
<td>AMT1102</td>
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<thead>
<tr>
<th>Third Semester</th>
<th>Hours</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>AMT/MIT2101 Brakes and Driveline Theory</td>
<td>3</td>
<td>AMT1201</td>
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<tr>
<td>AMT/MIT2102 Brakes and Driveline Shop</td>
<td>4</td>
<td>AMT1202</td>
</tr>
<tr>
<td>AMT/MIT2121 Automotive Drivetrain Systems Theory</td>
<td>3</td>
<td>AMT/MIT110-1201-1221</td>
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<tr>
<td>AMT/MIT2122 Automotive Drivetrain Systems Shop</td>
<td>4</td>
<td>AMT/MIT1120-1202-1222</td>
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<thead>
<tr>
<th>Fourth or Fifth Semester</th>
<th>Hours</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>AHP2202 High Performance Engines</td>
<td>12</td>
<td>All of the above</td>
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<tr>
<td>AHP2220 High Performance Tuning</td>
<td>12</td>
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Total technical credit hours required 66

**GENERAL EDUCATION COURSES**

<table>
<thead>
<tr>
<th>English/Social Sciences</th>
<th>Hours</th>
<th>Prerequisites</th>
</tr>
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<tbody>
<tr>
<td>ENGL101 College Composition I</td>
<td>3</td>
<td>Placement Exam or ENGL099</td>
</tr>
<tr>
<td>ENGL202 College Composition II</td>
<td>3</td>
<td>ENGL101</td>
</tr>
<tr>
<td>COMM105 Oral Communications</td>
<td>3</td>
<td></td>
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<tr>
<td>SOC206 Principles of Sociology or</td>
<td>3</td>
<td>ENGL099 (Co. Req.)</td>
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<tr>
<td>PSY1206 Introduction to Psychology</td>
<td>3</td>
<td>ENGL099 (Co. Req.)</td>
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<thead>
<tr>
<th>Mathematics/Science</th>
<th>Hours</th>
<th>Prerequisites</th>
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<tr>
<td>MTH1110 Elementary Algebra and MTH111 Intermediate Algebra or</td>
<td>6</td>
<td>Placement Exam or MTH1099</td>
</tr>
<tr>
<td>MTH1100 Elementary/Intermediate Algebra</td>
<td>3</td>
<td>Placement Exam</td>
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<tr>
<td>PHY1200 Conceptual Physics</td>
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<td>MTH1110</td>
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<tr>
<th>Business/Information Technology</th>
<th>Hours</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>CIT1100 Computer Literacy</td>
<td>2</td>
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<tr>
<td>WFD1200 Job Search Success</td>
<td>1</td>
<td>MNG1220 or BUS1204 (Co. Req.)</td>
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<tr>
<td>MNG1204 Introduction to Business and Management</td>
<td>3</td>
<td>ENGL099 (Co. Req.)</td>
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<table>
<thead>
<tr>
<th>Associate of Science Additional Required Courses</th>
<th>Hours</th>
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<tr>
<td>MTH2121 College Algebra</td>
<td>3</td>
<td>MTH1100 or MTH111</td>
</tr>
<tr>
<td>MTH2220 Trigonometry</td>
<td>3</td>
<td>MTH2112</td>
</tr>
<tr>
<td>PHY2230 College Physics (Substitute for PHY2100)</td>
<td>3</td>
<td>MTH2220</td>
</tr>
<tr>
<td>MTH2240 Survey of Calculus</td>
<td>3</td>
<td>MTH2112</td>
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</tbody>
</table>

Important Note: Only courses in which a grade of “C” or higher is earned may be applied toward this Ranken degree.
high performance racing technology

**COURSE DESCRIPTIONS**

**AMT1101 Auto Electricity Theory**
Covers the theory and application of the fundamentals of automotive electrical and electronics systems, including basic electrical/electronics theory testing and servicing. The course details automotive systems such as batteries, cranking motors and their control circuits, charging systems (alternators, mechanical and electronic regulators), chassis wiring diagnosis and repair and gauges (mechanical and electronic). Three credit hours.

**AMT1102 Auto Electricity Shop**
Hands-on application of AMT1101 in a shop setting. Four credit hours.

**AMT1110 Engines Theory**
Students are introduced to the internal combustion engine, including component operation, diagnosis and service, removal, disassembly and measurement of components, reassembly, installation and adjustments. Three credit hours.

**AMT1120 Engines Shop**
Hands-on application of AMT1110 in a shop setting. Four credit hours.

**AMT/GMT1201 Advanced Electricity/AC Theory**
Emphasizes the theory and application of advanced electronics, including ignitions systems (electronic distributorless and coil-on-plug), accessories, supplemental restraint systems, multi-computer systems, computer communications and computer sensory systems. Students get an overview of A/C fundamentals, including system diagnosis, repair of manual and automotive heating ventilation and air conditioning systems. Three credit hours.

**AMT/GMT1202 Advanced Electricity/AC Shop**
Hands-on application of AMT/GMT1201 in a shop setting. Four credit hours.

**AMT/GMT1221 Suspension and Steering Theory**
Covers the diagnosis, service, repair and adjustment of chassis components, including front and rear suspension systems, manual and power steering, wheel alignments, tires and wheel balancing. Three credit hours.

**AMT/GMT1222 Suspension and Steering Shop**
Hands-on application of AMT/GMT1221 in a shop setting. Four credit hours.

**AMT/GMT2101 Brakes and Driveline Theory**
Covers the diagnosis, service, repair and adjustment of drive axles, including limited slip differentials and axle shafts. Students learn brake systems, including drum and disc systems, hydraulic systems, power assist systems, drum and rotor machining antilock and slip regulation systems. Three credit hours.

**AMT/GMT2102 Brakes and Driveline Shop**
Hands-on application of AMT/GMT2101 in a shop setting. Four credit hours.

**AMT/GMT2121 Automotive Drivetrain Theory**
Covers the diagnosis, service, repair and adjustment of automatic transmissions, manual transmissions and four- and all-wheel drive transfer cases. Includes the diagnosis and service procedures of U-joints and constant velocity joints. Three credit hours.

**AMT/GMT2122 Automatic Drivetrain Shop**
Hands-on application of AMT/GMT2121 in a shop setting. Four credit hours.

**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 and dyno test it 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 also 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 be covered, along with nitrous and propane injection. Students also learn carburetor modification and tuning and power train gear setting and suspension systems. Twelve credit hours.
» high performance racing technology

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 89. For more information about the BSAM degree, please turn to page 92.

<table>
<thead>
<tr>
<th>PROGRAM COURSES</th>
<th>Hours</th>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>First or Second Semester AHP2202</td>
<td>12</td>
<td>AMT associate degree from Ranken or</td>
</tr>
<tr>
<td>AHP2220 High Performance Engines</td>
<td></td>
<td>successful completion of the online course.</td>
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</table>

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.