



# AUTOMOTIVE TECHNICIAN

## Technical Diploma Program Code: 32-404-2 Total Credits: 59-60

Mid-State's Automotive Technician program gives students the experience and skills they need to diagnose and repair today's vehicles. The program emphasizes engine and transmission repair, the drive train and axles, suspension and steering systems, brakes, electrical systems, heating and air conditioning, and engine performance. You'll receive instruction from industry experts and have access to state-of-the-art equipment, including a variety of hand and power tools and complex electrical diagnostic equipment. Hands-on learning and opportunities to diagnose and repair cars for real customers will have you ready to enter the workforce with confidence.

**Estimated tuition and fees:** [mstc.edu/programcosts](http://mstc.edu/programcosts)

### ACADEMIC ADVISOR

To schedule an appointment with an academic advisor, call 715.422.5300. Academic advisors will travel to other campuses as necessary to accommodate student needs. For more information about advising, visit [mstc.edu/advising](http://mstc.edu/advising).

### CHECKLIST:

This section will be completed when meeting with your academic advisor.

- FAFSA ([www.fafsa.gov](http://www.fafsa.gov))
- Financial Aid Form(s)  
Form(s): \_\_\_\_\_
- Follow-Up Appointment:  
Where: \_\_\_\_\_  
When: \_\_\_\_\_  
With: \_\_\_\_\_
- Official Transcripts  
Mid-State Technical College  
Student Services Assistant  
1001 Centerpoint Drive  
Stevens Point, WI 54481
- Other: \_\_\_\_\_  
\_\_\_\_\_



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**ADAMS CAMPUS**  
401 North Main  
Adams, WI 53910

**MARSHFIELD CAMPUS**  
2600 West 5th Street  
Marshfield, WI 54449

**STEVENS POINT CAMPUS**  
1001 Centerpoint Drive  
Stevens Point, WI 54481

**WISCONSIN RAPIDS CAMPUS**  
500 32nd Street North  
Wisconsin Rapids, WI 54494

# CAREER PATHWAY • BEGIN AT ANY POINT

HIGH SCHOOL STUDENT

COLLEGE TRANSFER

RETURNING ADULT

## CREDIT FOR PRIOR LEARNING AND EXPERIENCE

### CREDIT FOR PRIOR LEARNING AND EXPERIENCE

- Certifications and Licenses
- High School Credit
- Military Experience
- National/Standardized Exams
- Transfer Credit
- Work and Life Experience

Learn about Credit for Prior Learning at [mstc.edu/cpl](https://mstc.edu/cpl).

## TECHNICAL DIPLOMA

### AUTOMOTIVE MAINTENANCE TECHNICIAN

Technical Diploma • 27 Credits

#### Start Your Career

- Automotive Apprentice
- Automotive Parts Sales/Service
- Tire and Lube Technician

### AUTOMOTIVE TECHNICIAN

Technical Diploma • 59-60 Credits

#### Start Your Career

- Automotive and Light Truck Technician
- Automotive Master Mechanic
- Engine Technician

## BACHELOR'S DEGREE

### BACHELOR'S DEGREE OPTIONS

For more information and additional opportunities, visit [mstc.edu/transfer](https://mstc.edu/transfer).

## OTHER OPTIONS

### RELATED PROGRAMS

- Diesel & Heavy Equipment Technician
- Diesel & Heavy Equipment Technician Assistant

## PROGRAM OUTCOMES

Employers will expect you, as an Automotive Technician graduate, to be able to:

- Demonstrate professionalism appropriate for the auto service industry.
- Perform diagnosis, service, and repair of automotive internal combustion engines.
- Perform diagnosis, service, and repair of automotive automatic transmission/transaxle systems.
- Perform diagnosis, service, and repair of automotive manual drive train and axle systems.
- Perform diagnosis, service, and repair of automotive steering and suspension systems.
- Perform diagnosis, service, and repair of automotive brake systems.
- Perform diagnosis, service, and repair of automotive electrical and electronic systems.
- Perform diagnosis, service, and repair of automotive heating and air conditioning systems.
- Perform diagnosis, service, and repair of automotive engine performance systems.

## TECHNICAL SKILLS ATTAINMENT

The Wisconsin Technical College System (WTCS) has implemented a requirement that all technical colleges measure program outcomes attained by students. This requirement is called Technical Skills Attainment (TSA). The main objective of TSA is to ensure graduates have the technical skills needed by employers. Students are notified of TSA reporting in the Service Practices and Fuel Control Systems courses.

## PROTECTIVE CLOTHING

Students are required to purchase three “Mid-State Automotive Technician Student” uniform shirts. These shirts are available the first week of class for approximately \$30 each. Students are also required to wear safety glasses at all times in the lab. Acquisition of safety glasses is the responsibility of the student.

## REQUIRED EQUIPMENT

Students need to purchase a Fluke 177 or Fluke 88V multimeter and test lead set before the start of the second term. These are available for purchase through the campus Bookstore for approximately \$270.

## STUDENT HANDBOOK

Visit [mstc.edu/studenthandbook](http://mstc.edu/studenthandbook) to view Mid-State's student handbook, which contains information about admissions, enrollment, appeals processes, services for people with disabilities, financial aid, graduation, privacy, Mid-State's Student Code of Conduct, and technology.

## GRADUATION REQUIREMENT

The GPS for Student Success course is required for all Mid-State program students and is recommended to be completed before obtaining 12 credits. (Not counted in the total credit value for this program.) Some students are exempt from this requirement. Please see your program advisor for more information.

### GPS for Student Success

#### **10890102 ..... 1 credit**

Integrate necessary skills for student success by developing an academic plan, identifying interpersonal attributes for success, adopting efficient and effective learning strategies, and utilizing Mid-State resources, policies, and processes. This course is recommended to be completed prior to obtaining 12 credits and is a graduation requirement unless you receive an exemption from your program advisor.

## ADDITIONAL COURSES AS NEEDED

The following courses may be recommended or required if the student does not achieve minimum Accuplacer scores.

### College Reading and Writing 1

#### **10831104 ..... 3 credits**

Provides learners with opportunities to develop and expand reading and writing skills to prepare for college-level academic work. Students will employ critical reading strategies to improve comprehension, analysis, and retention of texts. Students will apply the writing process to produce well-developed, coherent, and unified written work.

### Pre-Algebra

#### **10834109 ..... 3 credits**

Provides an introduction to algebra. Includes operations on real numbers, solving linear equations, percent and proportion, and an introduction to polynomials and statistics. Prepares students for elementary algebra and subsequent algebra-related courses.

## SAMPLE FULL-TIME CURRICULUM OPTION

Term	14-15 credits
31804305 Applied Mathematics	2
<b>-or-</b>	
10804107 College Mathematics ☑	3
32404307 Suspension & Steering Systems ☑	5
32404308 Braking Systems-Automotive ☑	5
32404375 Service Practices in Automotive Industry ☑	1
32404340 Intro to Electricity for the Automotive Industry ☑	1
<b>Term</b>	<b>15 credits</b>
31442320 Welding Foundations 1	1
31442321 Welding Foundations 2	1
10457119 Fabrication Fundamentals 1	1
32404311 Electrical Systems-Auto	5
32404324 Engine Repair	5
32404330 Applied Fluid Power ☑	2
<b>Term</b>	<b>15 credits</b>
32404313 Electric Control Systems	2
31801368 Workplace Communication	1
32404323 Automatic Transmissions	5
32404325 Manual Transmissions	5
32806351 Applied Science	2
<b>Term</b>	<b>15 credits</b>
32404312 Advanced Electrical Systems-Auto	5
32404320 Hybrid Systems-Auto	1
32404322 Heating/Air Conditioning	3
32404326 Fuel Control System-Auto	5
32404377 Business Practices in the Transportation Industry	1
<b>Total credits 59-60</b>	

☑ This course has options available to receive credit for prior learning (CPL) or work experience. Visit the website at [mstc.edu/cpl](http://mstc.edu/cpl) or contact your advisor for details.

**Please Note:**

- This curriculum sequence is only for student planning. Actual student schedules will vary depending on course availability.
- Program completion time may vary based on student scheduling and course availability. For details, go to [mstc.edu/schedule](http://mstc.edu/schedule).

## SAMPLE PART-TIME CURRICULUM OPTION

Term	7 credits
32404307 Suspension & Steering Systems ☑	5
32404340 Intro to Electricity for the Automotive Industry ☑	1
32404375 Service Practices in Automotive Industry ☑	1
<b>Term</b>	<b>7 credits</b>
32404311 Electrical Systems-Auto	5
32404330 Applied Fluid Power ☑	2
<b>Term</b>	<b>7 credits</b>
32404308 Braking Systems-Automotive ☑	5
31442320 Welding Foundations 1	1
31442321 Welding Foundations 2	1
<b>Term</b>	<b>6 credits</b>
10457119 Fabrication Fundamentals 1	1
32404324 Engine Repair	5
<b>Term</b>	<b>9-10 credits</b>
31804305 Applied Mathematics	2
<b>-or-</b>	
10804107 College Mathematics ☑	3
32404323 Automatic Transmissions	5
32806351 Applied Science	2
<b>Term</b>	<b>8 credits</b>
32404312 Advanced Electrical Systems-Auto	5
32404322 Heating/Air Conditioning	3
<b>Term</b>	<b>8 credits</b>
32404313 Electric Control Systems	2
31801368 Workplace Communication	1
32404325 Manual Transmissions	5
<b>Term</b>	<b>7 credits</b>
32404320 Hybrid Systems-Auto	1
32404326 Fuel Control System-Auto	5
32404377 Business Practices in the Transportation Industry	1
<b>Total credits 59-60</b>	

### MULTIPLE MEASURES

**Multiple Measures Writing (MMW):** High school GPA of 2.6 and successful completion of 2.0 credits of high school writing courses with a "C" or better

**Multiple Measures Reading (MMR):** High school GPA of 2.6 and successful completion of 2.0 credits of high school literature courses with a "C" or better

**Multiple Measures Math 1 (MMM\_1):** High school GPA of 2.6 and successful completion of 1.0 credits of high school math (Algebra 1 or equivalent) with a "C" or better

**Multiple Measures Math 2 (MMM\_2):** High school GPA of 2.6 and successful completion of 2.0 credits of high school math including Algebra 1 and Algebra 2 with a "C" or better

**Multiple Measures Science 1 (MMS\_1):** High school GPA of 2.6 and successful completion of 1.0 credits of high school lab science course with a "C" or better

**Multiple Measures Science 2 (MMS\_2):** High school GPA of 2.6 and successful completion of 1.0 credits of high school chemistry with a "C" or better

*Past high school and college transcripts are used in making course placement decisions.*

# COURSE DESCRIPTIONS

## **Advanced Electrical Systems-Auto**

**32404312** .....5 credits

Learners employ theory and operational fundamentals to diagnose and repair vehicle electronic/electrical systems, including computer self-diagnosis, scanners, analyzers, sensors, actuators, and computerized ignitions. Also covers diagnostic and repair procedures on major electrical-electronic emission control systems.

*Corequisite: Electrical Systems-Auto 32404311*

## **Applied Fluid Power**

**32404330** .....2 credits

Learners employ basic principles and application of pumps, compressors, motors, valves, seals, packing, and conductors to demonstrate the advantage of hydraulic and pneumatic systems as well as the physical properties of liquids and air. The intent is to identify various parts of a circuit and to illustrate standard liquid power components through laboratory experiments.

## **Applied Mathematics**

**31804305** .....2 credits

Students taking Applied Mathematics make and convert various measurements. Students use formulas to solve problems. They compute dimensions of geometric shapes. Students use statistical tools to represent and analyze data. They analyze various financial situations. Students use basic right triangle trigonometry to solve problems. In each topic area, students solve application problems.

## **Applied Science**

**32806351** .....2 credits

This survey course in basic physics is designed for students in the Automotive Technician, Diesel & Heavy Equipment Technician, and Precision Machining Technician programs. Topics have been specially selected to provide students with basic support material for principles applied in the above listed programs. Topics to be covered include basic measurement skills; problem solving; motion; forces and energy transfer in linear and rotary systems; properties of solids, liquids and gases; temperature and heat; and basic DC electricity.

## **Automatic Transmissions**

**32404323** .....5 credits

Learners practice automatic transmission diagnosis and repair. Topics include gear systems, hydraulic and electronic control systems, transmission servicing, in vehicle repair, and out of vehicle transmission overhaul.

*Prerequisites: Electrical Systems-Auto 32404311 and Applied Fluid Power 32404330*

## **Braking Systems-Automotive**

**32404308** .....5 credits

Learners employ fundamentals of vehicle braking systems including drum, disc, hydraulic and air systems to perform on-vehicle repairs. Includes instruction on power and anti-skid systems with emphasis on troubleshooting and component replacement and reconditioning.

## **Business Practices in the Transportation Industry**

**32404377** .....1 credit

Provides learners with hands on experience completing repair orders, customer service and parts management. Students will learn from instructors, local shop owners and professionals in the industry. Topics covered will include shop management, insurance and worker's compensation considerations, warranties, and pricing systems.

*Corequisite: Fuel Control System-Auto 32404326*

## **College Mathematics**

**10804107** .....3 credits

This course is designed to review and develop fundamental concepts of mathematics in the areas of algebra, geometry, trigonometry, measurement and data. Algebra topics emphasize simplifying algebraic expressions, solving linear equations and inequalities with one variable, solving proportions and percent applications. Geometry and trigonometry topics include; finding areas and volumes of geometric figures, applying similar and congruent triangles, applying Pythagorean Theorem, and solving right triangles using trigonometric ratios. Measurement topics emphasize the application of measurement concepts and conversion techniques within and between U.S. customary and metric system to solve problems. Data topics emphasize data organization and summarization skills, including: frequency distributions, central tendency, relative position and measures of dispersion. Special emphasis is placed on problem solving, critical thinking and logical reasoning, making connections, and using calculators.

*Prerequisite: High School GPA of 2.6 and MMM\_1 or Accuplacer Arithmetic of 250 and QAS 234 or ACT Math score of 17 or Pre-Algebra 10834109 with a "C" or better*

## **Electrical Systems-Auto**

**32404311** .....5 credits

Learners employ principles of construction, function, and operation of starting motors, charging systems, and controls. Covers basic electronics, including capacitance, inductance, series and parallel circuits, magnetism and Ohm's Law, wiring schematics, soldering techniques, and use of diagnostic equipment. Vehicle control and accessory systems are studied.

*Prerequisite: Intro to Electricity for the Automotive Industry 32404340*

## **Electric Control Systems**

**32404313** .....2 credits

Introduces learners to fundamental electronic control programming logic, terminology, and design. Learners practice basic programming and digital control techniques complete control tasks that are analogous to control tasks found in modern automobiles.

*Prerequisite: Applied Mathematics 3184305.*

# COURSE DESCRIPTIONS

## Engine Repair

**32404324 .....5 credits**

Learners practice diagnosis, reconditioning and repair of cylinder heads, valve train components, and engine blocks and related components. Provides a general overview of engine types and operating characteristics. Covers engine support systems such as the lubrication systems, cooling system, ignition system, fuel and exhaust systems.

*Corequisite: Electrical Systems-Auto 32404311.*

## Fabrication Fundamentals 1

**10457119.....1 credit**

An introduction to structural shapes and sheet metal fabrication. Presents fabrication techniques, metal selection, and layout, cutting, bending, drilling, threading, and joining using manual equipment and techniques. Information is presented to the student and followed up with lab activities to provide a hands-on experience. Emphasizes developing an understanding of the tools, techniques, safe work habits, and application of sheet metal fabrication skills.

## Fuel Control System-Auto

**32404326 .....5 credits**

Learners identify and diagnose vehicle ignition systems, fuel systems, air induction systems, emission control systems, and engine electrical systems. Focuses on fault diagnosis, component testing, and repairs for domestic as well as import vehicles. Includes a review of engine operation and related servicing.

## Heating/Air Conditioning

**32404322 .....3 credits**

Provides an introduction to vehicle air conditioning systems. System components, operating characteristics, component testing, diagnosis, and repair are covered in detail for popular system types. Includes servicing of engine cooling systems as well as diagnosis and servicing of vehicle heating systems.

## Hybrid Systems-Auto

**32404320 .....1 credit**

Learners receive a general overview of hybrid vehicle systems, including motor, inverter, and CVT operation. Also provides an overview of hybrid safety requirements and demonstration of proper high voltage lockout procedures.

*Prerequisite: Automatic Transmissions 32404323; Corequisites: Advanced Electrical Systems-Auto 32404312 and Fuel Control Systems-Auto 32404326*

## Intro to Electricity for the Automotive Industry ☑

**32404340.....1 credit**

Introduces learners to electrical measurement tools and techniques. Includes both hands-on experience and theory on topics including multimeter operation, Ohm's law, wiring diagram interpretation, and circuit testing. Content is focused on tools and procedures commonly used in automotive, and diesel/heavy equipment industries. Learners will have the opportunity to earn NC3 multimeter certification during this course.

## Manual Transmissions

**32404325 .....5 credits**

Learners practice manual drivetrain fault diagnosis and repair. Topics includes clutch, drive shaft, and universal joint diagnosis and servicing. Additional topics include rear axle servicing and four-wheel drive diagnosis and repair.

*Corequisite: Automatic Transmissions 32404323*

## Service Practices in Automotive Industry ☑

**32404375 .....1 credit**

Introduces the learner to common tools, terminology, and service practices in the transportation field. Covers safety, environmental concerns, and basic customer relations. Service shop management practices and the use of automated work order, parts ordering, and time management concepts are included.

## Suspension & Steering Systems ☑

**32404307 .....5 credits**

Analyze construction and working principles of chassis components. Includes frames, suspension systems, steering gears and linkages, wheels and tires, and wheel alignment. Learners practice on-vehicle diagnosis and repair of suspension and steering systems.

## Welding Foundations 1

**31442320 .....1 credit**

An introduction to fundamental welding techniques with an emphasis on safe work habits that covers the processes of FCAW, GMAW, and OXY-Fuel cutting. Classroom instruction paired with lab activities are designed to provide fundamental skills in each of the welding processes covered in the class.

## Welding Foundations 2

**31442321 .....1 credit**

An introduction to fundamental welding techniques with an emphasis on safe work habits that covers the processes of GTAW, SMAW and Plasma cutting. Classroom instruction paired with lab activities are designed to provide fundamental skills in each of the welding processes covered in the class.

## Workplace Communication

**31801368 .....1 credit**

Analyze workplace communication situations to develop professional verbal and written communication skills. Learners apply verbal and written communication skills, as well as conflict resolution strategies, to improve workplace communication climates and promote personal and professional growth.