



DIESEL & HEAVY EQUIPMENT TECHNICIAN

Technical Diploma Program Code: 32-412-1 Total Credits: 58-59

Graduates of Mid-State's Diesel & Heavy Equipment Technician program have the knowledge and skills to confidently locate and repair mechanical and electrical problems in trucks, buses, construction equipment, farm equipment, and industrial machinery. Through hands-on classroom learning and training on state-of-the-art equipment, you will learn to perform preventive maintenance and troubleshooting procedures, rebuild components, and respond to field service calls. You'll also participate in field trips, tours, and equipment demonstrations, and you'll get real-world experience by maintaining Mid-State's vehicle fleet and operating onsite equipment.

Estimated tuition and fees: 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.

CHECKLIST:

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

- FAFSA (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: _____



mstc.edu • 888.575.6782 • TTY: 711



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.

TECHNICAL DIPLOMA

DIESEL & HEAVY EQUIPMENT TECHNICIAN ASSISTANT

Technical Diploma • 29 Credits

Start Your Career

- Light Maintenance Technician
- Parts Associate
- Undercarriage Technician

DIESEL & HEAVY EQUIPMENT TECHNICIAN

Technical Diploma • 58-59 Credits

Start Your Career

- Bus and Truck Technician
- Heavy Equipment Technician
- Fleet Maintenance Technician

BACHELOR'S DEGREE

BACHELOR'S DEGREE OPTIONS

For more information and additional opportunities, visit mstc.edu/transfer.

OTHER OPTIONS

RELATED PROGRAMS

- Automotive Maintenance Technician
- Automotive Technician

SAMPLE FULL-TIME CURRICULUM OPTION

Term		15 credits
10457119	Fabrication Fundamentals 1	1
31442320	Welding Foundations 1	1
31442321	Welding Foundations 2	1
32412375	Service Practices in Diesel Industry ☑	1
32412340	Intro to Electricity for the Diesel Industry ☑	1
32412308	Braking Systems-Diesel	5
32412309	Suspension & Steering Systems	5

Term		14 credits
31801368	Workplace Communication	1
32462302	Mobile Hydraulics ☑	2
32412305	Preventive Maintenance-Diesel	3
32412312	Drivetrains	4
32412313	Electrical Systems	4

Term		15-16 credits
31804305	Applied Mathematics	2
	-or-	
10804107	College Mathematics ☑	3
32412303	Heating/AC-Diesel ☑	3
32412324	Engine Repair	5
32412327	Fuel Systems & Alternative Fuels	5

Term		14 credits
32412310	Engine Performance & Emissions-Diesel	5
32412311	Advanced Electricity-Diesel	5
32412330	Capstone-Live Diesel Repair	2
32806351	Applied Science	2

Total credits 58-59

☑ This course has options available to receive credit for prior learning (CPL) or work experience. Visit the website at 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.

SAMPLE PART-TIME CURRICULUM OPTION

Term		11 credit
32412308	Braking Systems-Diesel	5
32412309	Suspension & Steering Systems	5
32412340	Intro to Electricity for the Diesel Industry ☑	1

Term		12 credits
32412305	Preventive Maintenance-Diesel	3
32412313	Electrical Systems	4
32412324	Engine Repair	5

Term		7-8 credits
10457119	Fabrication Fundamentals 1	1
10457120	Fabrication Fundamentals 2	1
31442320	Welding Foundations 1	1
31442321	Welding Foundations 2	1
31804305	Applied Mathematics	2
	-or-	
10804107	College Mathematics ☑	3
32412375	Service Practices in Diesel Industry ☑	1

Term		10 credits
31801368	Workplace Communication	1
32412303	Heating/AC-Diesel ☑	3
32412312	Drivetrains	4
32806351	Applied Science	2

Term		7 credits
32412327	Fuel Systems & Alternative Fuels	5
32462302	Mobile Hydraulics ☑	2

Term		12 credits
32412310	Engine Performance & Emissions-Diesel	5
32412311	Advanced Electricity-Diesel	5
32412330	Capstone-Live Diesel Repair	2

Total credits 58-59

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 Electricity-Diesel

324123115 credits

Learner receives advanced training in the theory, operating principles, and diagnosis and repair of vehicle electronic/electrical systems. Emphasis on diagnosis and repair of vehicle ignition, starting, charging, lighting, and electronic powertrain systems as related to the transportation, agriculture, and heavy equipment industry.

Prerequisites: Engine Repair 32412324 and Fuel Systems & Alternative Fuels 32412327

Applied Mathematics

318043052 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

328063512 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.

Braking Systems-Diesel

324123085 credits

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

Capstone-Live Diesel Repair

324123302 credits

Learners have the opportunity to work on "live" diagnostic and repair projects and have their knowledge and skills assessed across a wide spectrum of projects provided by business and industry. Work orders, troubleshooting, parts ordering, installation, and quality checks are all elements included to provide real-life experiences as students prepare to begin their diesel and heavy equipment career.

Prerequisites: Engine Repair 32412324 and Fuel Systems & Alternative Fuels 32412327; Corequisites: Engine Performance & Emissions-Diesel 32412310 and Advanced Electricity-Diesel 32412311

College Mathematics

108041073 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

Drivetrains

32412312 4 credits

Learners practice on-vehicle diagnosis and repair of clutches, manual transmissions, drive shafts and universal joints, and drive axles. Provides general overview of the most common transmissions and drive train components used in industry. The diagnostic and service procedures studied apply to the truck, construction, and heavy equipment industries.

Prerequisites: Suspension & Steering Systems 32412309 and Braking Systems-Diesel 32412308.

Electrical Systems

32412313 4 credits

Learners employ principles of construction, function, and operation of batteries, starting systems, charging systems, and controls. Incorporates basic electronics, including series and parallel circuits, magnetism and Ohm's Law, wiring schematics, soldering techniques, and use of diagnostic equipment.

Prerequisite: Intro to Electricity for the Diesel Industry 32412340

Engine Performance & Emissions-Diesel

324123105 credits

Learners employ principles of construction, function, and operation of ignition systems, fuel systems, air induction systems, exhaust systems, emission control systems. Emphasizes the proper diagnosis, repair, and tune-up of system components as related to the transportation, agriculture, and heavy equipment industry.

Prerequisites: Engine Repair 32412324 and Fuel Systems & Alternative Fuels 32412327

COURSE DESCRIPTIONS

Engine Repair

32412324.....5 credits

Learners disassemble, measure, and inspect all mechanical components of a diesel engine. This course emphasizes the diagnosis and repair of cylinder heads, valve train, cylinder components, engine blocks, and related hardware. Also covers engine support systems, such as lubrication and cooling.

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 Systems & Alternative Fuels

32412327.....5 credits

Learners employ principles of construction, function, and operation of low pressure fuel systems, governors, mechanical distributor pumps, multiple plunger pumps, electronic unit injectors, hydraulic actuated electronic unit injectors, and common rail fuel systems. This course emphasizes diagnosis and repair of mechanical, hydraulic, and common rail fuel systems.

Heating/AC-Diesel ☑

32412303.....3 credits

Introduces the learner to the theory and operation of the heating and air conditioning systems found in transportation, farm, and heavy equipment industries. Focuses on the inspection, diagnoses, and repair of heating and air conditioning systems found in the diesel field. Learners have the opportunity to acquire their EPA 608 and 609 Certification. Offers experience in installation, operation, and repair of auxiliary power units along with refrigeration units.

Intro to Electricity for the Diesel Industry ☑

32412340.....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.

Mobile Hydraulics ☑

32462302.....2 credits

Learners employ basic principles and application of pumps, compressors, motors, valves, actuators, and conductors to demonstrate the understanding of hydraulic systems as well as the physical properties of liquids. Learners will identify various parts of a circuit in order to perform light maintenance and troubleshooting in hydraulic systems used on heavy truck, earth-moving, or agricultural equipment.

Preventive Maintenance-Diesel

32412305.....3 credits

Introduces learner to vehicle preventive maintenance and inspection. Focuses on maintaining and inspecting the engine system, cab, electrical and electronics, and frame and chassis components with an emphasis on DOT inspections. Learners practice proper service on vehicle systems and perform a visual inspection of all vehicle components. Learners also practice how to properly document all maintenance and inspection findings.

Prerequisites: Suspension & Steering Systems 32412309 and Braking Systems-Diesel 32412308.

Service Practices in Diesel Industry ☑

32412375.....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

32412309.....5 credits

Analyze the construction and working principles of chassis components to perform on vehicle repairs. Includes instruction on 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 SMAW, 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, FCAW 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.