



diesel & heavy equipment technician

Technical Diploma

Program Code: 32-412-1

Total Credits: 63

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



ADAMS CAMPUS
401 North Main
Adams, WI 53910

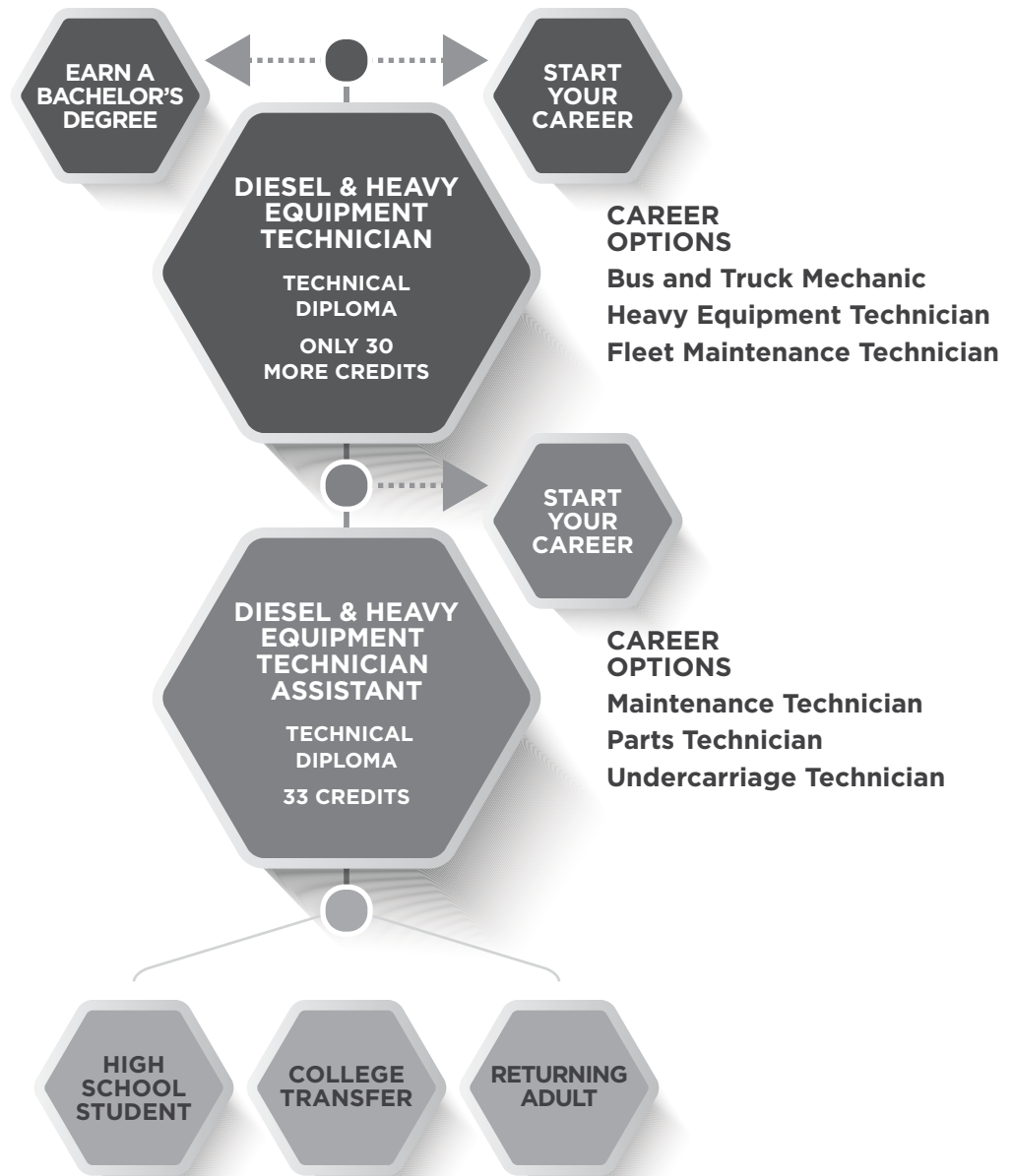
MARSHFIELD CAMPUS
2600 West 5th Street
Marshfield, WI 54449

STEVENS POINT CAMPUS
1001 Centerpoint Drive
Stevens Point, WI 54481

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

BACHELOR'S DEGREE OPTIONS

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



College Credit • Dual Credit • Military Experience • Work Experience
Learn about Credit for Prior Learning at mstc.edu/cpl.

**BEGIN AT ANY POINT
IN THE PATHWAY**

OTHER OPTIONS

RELATED PROGRAMS

- Automotive Maintenance Technician
- Automotive Technician

PROGRAM OUTCOMES

Employers will expect you, as a Diesel & Heavy Equipment Technician graduate, to be able to:

- Diagnose major systems in the diesel and heavy equipment industry.
- Repair major systems in the diesel and heavy equipment industry.
- Service major systems in the diesel and heavy equipment industry.
- Practice personal and professional work habits.
- Document complaint, cause, and correction.

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 their final few courses of the program.

PROTECTIVE CLOTHING

Students are required to wear school uniform shirts while working in the diesel shop. Uniform shirts can be purchased from the Wisconsin Rapids campus Bookstore. Students are also required to provide and wear leather work shoes with oil-resistant soles.

NOTES:

STUDENT HANDBOOK

Visit 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 must be completed prior to obtaining 12 credits and as a graduation requirement.

ADDITIONAL COURSES AS NEEDED

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

Intro to College Reading

10838104 2 credits

Provides learners with the opportunities to develop and expand reading skills, including comprehension and vocabulary skills. Learners apply reading skills to academic tasks and read to acquire information from a variety of sources.

Intro to College Writing

10831103 3 credits

Introduces basic principles of composition, including organization, development, unity, and coherence in paragraphs and multi-paragraph documents. The purpose of this course is to prepare students for successful entry into required program courses. This course is tuition bearing and under certain circumstances may qualify for financial aid. This course cannot be used to satisfy program completion requirements at Mid-State.

Prerequisite: Accuplacer Sentence Skills score of 60 or equivalent. Proficiency in word processing skills recommended.

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.

Prerequisite: Accuplacer Math score of 65, Accuplacer Algebra score of 30, ABE Math Prep V 76854785 and ABE Math Prep VI 76854786 with a grade of "S." (Note: ABE Math Prep V and VI courses cannot be used to satisfy program completion requirements at Mid-State.)

SAMPLE FULL-TIME CURRICULUM OPTION

Term		16 credits
10442117	Welding Fundamentals 1	1
10442118	Welding Fundamentals 2	1
10457119	Fabrication Fundamentals 1	1
10457120	Fabrication Fundamentals 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		17 credits
10102130	Career Development -or-	
10801199	Employment Strategies	3
10462121	Mobile Hydraulics Repair	3
32412305	Preventive Maintenance-Diesel	3
32412312	Drivetrains	4
32412313	Electrical Systems	4

Term		16 credits
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 63

SAMPLE PART-TIME CURRICULUM OPTION

Term		11 credits
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		8 credits
10804107	College Mathematics	3
10442117	Welding Fundamentals 1	1
10442118	Welding Fundamentals 2	1
10457119	Fabrication Fundamentals 1	1
10457120	Fabrication Fundamentals 2	1
32412375	Service Practices in Diesel Industry	1

Term		12 credits
10102130	Career Development -or-	
10801199	Employment Strategies	3
32412303	Heating/AC-Diesel	3
32412312	Drivetrains	4
32806351	Applied Science	2

Term		8 credits
10462121	Mobile Hydraulics Repair	3
32412327	Fuel Systems & Alternative Fuels	5

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

Total credits 63

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/classfinder.

NOTES:

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: Admission to Diesel & Heavy Equipment Technician program 324121, Engine Repair 32412324, and Fuel Systems & Alternative Fuels 32412327

Applied Science

328063512 credits

This survey course in basic physics is designed for students in the Automotive Technician, Diesel & Heavy Equipment Technician, and Machine Tool 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.

Prerequisite: College Mathematics 10804107 with a grade of "C" or better.

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.

Prerequisite: Admission to Diesel & Heavy Equipment Technician program 324121 or Diesel & Heavy Equipment Technician Assistant program 314122

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

Career Development

101021303 credits

Prepares learners for the process of gaining employment. Learners assess their personal background; practice finding career opportunities through the job search process; develop a cover letter, resume, and thank you letter, and complete a job application; participate in a mock interview; and demonstrate how to deal with interpersonal situations found in a work environment. NOTE: To enroll, you must have completed 50 percent of technical program credits or receive department approval. See program advisor, program faculty, program counselor, or department dean/associate dean to register.

College Mathematics

108041073 credits

Designed to review and develop fundamental concepts of mathematics pertinent to the areas of: 1) arithmetic and algebra; 2) geometry and trigonometry; and 3) probability and statistics. Special emphasis is placed on problem solving, critical thinking and logical reasoning, making connections, and using calculators. Topics include performing arithmetic operations and simplifying algebraic expressions, solving linear equations and inequalities in one variable, solving proportions and incorporating percent applications, manipulating formulas, solving and graphing systems of linear equations and inequalities in two variables, finding areas and volumes of geometric figures, applying similar and congruent triangles, converting measurements within and between US and metric systems, applying Pythagorean Theorem, solving right and oblique triangles, calculating probabilities, organizing data and interpreting charts, calculating central and spread measures, and summarizing and analyzing data.

Prerequisite: High School GPA of 3.0 or Accuplacer Arithmetic of 250 and QAS 234 or ACT of 17 or Pre-Algebra 834109 with a grade of "C" or better or equivalent. Students are encouraged to bring transcripts for further evaluation if they do not meet these requirements.

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: Admission to Diesel & Heavy Equipment Technician program 324121 or Diesel and Heavy Equipment Technician Assistant program 314122, 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.

Prerequisites: Admission to Diesel & Heavy Equipment Technician program 324121 or Diesel & Heavy Equipment Technician Assistant program 314122 and Intro to Electricity for the Diesel Industry 32412340

course descriptions

Employment Strategies

108011993 credits

A course designed to assist students in securing employment. This communication-based course helps develop an awareness of personal and academic skills as they relate to the job seeking process. Topics of study include personal and skill assessments, research of employment sources, completion of application forms, formation of professional resumes, composition of various business letters, interviewing skills, and job offer evaluation. NOTE: To enroll you must have completed 50 percent of technical program credits or receive department approval. See program advisor, program faculty, program counselor, or department dean/associate dean to register.

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: Admission to Diesel and Heavy Equipment Technician program 324121, Engine Repair 32412324, and Fuel Systems & Alternative Fuels 32412327*

Engine Repair

324123245 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. *Prerequisites: Admission to Diesel & Heavy Equipment Technician program 324121 and Preventive Maintenance-Diesel*

Fabrication Fundamentals 1

104571191 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.

Fabrication Fundamentals 2

104571201 credit

An introduction to plate steel and heavy fabrication. Presents fabrication techniques using heavy fabrication equipment. CNC Cutting, Plate and Tube bending, Sawing and Shearing equipment will be presented and followed up with lab activities to provide a hands-on experience. Emphasizes developing an understanding of the equipment, techniques, safe work habits, and application of heavy metal fabrication skills.

Fuel Systems & Alternative Fuels

324123275 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. *Prerequisites: Admission to Diesel & Heavy Equipment Technician program 324121; Preventive Maintenance-Diesel 32412305*

Heating/AC-Diesel

324123033 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. *Prerequisites: Admission to Diesel & Heavy Equipment Technician program 324121 and completion of Diesel & Heavy Equipment Technician Assistant program 314122*

Intro to Electricity for the Diesel Industry

324123401 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. *Prerequisite: Admission to Diesel & Heavy Equipment Technician program 324121 or Diesel & Heavy Equipment Technician Assistant program 314122*

Mobile Hydraulics Repair

104621213 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. *Prerequisite: Admission to Diesel & Heavy Equipment Technician program 324121 or Diesel & Heavy Equipment Technician Assistant program 314122*

Preventive Maintenance-Diesel

324123053 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: Admission to Diesel & Heavy Equipment Technician program 324121 or Diesel & Heavy Equipment Technician Assistant program 314122 and Suspension & Steering Systems 32412309; 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.

Prerequisite: Admission to Diesel & Heavy Equipment Technician program 324121 or Diesel & Heavy Equipment Technician Assistant program 314122

Suspension & Steering Systems

324123095 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.

Prerequisite: Admission to Diesel & Heavy Equipment Technician program 324121 or Diesel & Heavy Equipment Technician Assistant program 314122

Welding Fundamentals 1

10442117 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 Fundamentals 2

10442118 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.