Madison Area Technical College

Effective: 2009-2010

Diesel and Heavy Equipment Technician

Program Number: 32-412-1

Two-Year Technical Diploma

Transportation Program Cluster

Center for Construction, Manufacturing, Apprenticeship & Transportation

Program offered at Madison Campuses

For information call: (608) 243-4169 or (800) 322-6282 Ext. 4169

About the Program

The Diesel and Heavy Equipment Technician Program is a two-year diploma program for today's diesel industry. Trucking is one of the fastest-growing industries in the U.S., and all areas of the diesel industry are experiencing shortages of qualified technicians.

One out of seven people in Wisconsin work in the manufacture, distribution, maintenance or commercial use of motor vehicles. Agriculture and construction are other major portions of Wisconsin's economy and need trained technicians to keep modern equipment running.

Students learn to repair engines, transmissions, drivelines, electrical, electronic, hydraulic, fuel, brakes, air conditioning and transport refrigeration systems; adjust suspensions and wheel alignments; and perform maintenance and tune-ups.

Students are trained in simulated shop environments and are evaluated for attendance, work quality, efficiency, safety, initiative and cooperation as if they were actual employees. The program is also certified as an Association of Diesel Specialists (ADS) "TECH SMART" school. ADS monitors the curriculum, program and equipment, and ADS members sponsor students.

Unique Requirements for Admission

High school diploma or equivalent, including math, science, agricultural or industrial education courses. No prior automotive or mechanical experience is necessary, but it may be helpful.

Curriculum

FIRST YEAR			Hrs/week
First Semester		Credits	Lec-Lab
10-890-100	College Student Success OR	2	2-0
20-890-200	College Success	(2)	(2-0)
10-412-140	Introduction to Diesel Technology	1	2-4
10-412-155	Heavy Duty Drivetrains**	4	4-12
10-412-164	Brake and Suspension Systems*	4	4-12
10-442-126	Metal Repair Techniques	2	1-2
10-104-189	Customer Relations	2	2-0
31-804-379	Vocational Math 1	1	2-0
	Semester Total	16	
Second Semester			
10-412-137	Preventive Maintenance	4	4-4
10-412-144	Intro to Diesel Electrical/Electronics Systems*	3	6-10
10-103-133	Excel-Beginning	1	1-1/3
10-103-137	Word-Beginning	1	1-1/3
10-412-145	Electrical/Electronics Systems Diagnostics**	3	4-10
31-806-363	Science 1	2	2-2
	Semester Total	14	
SECOND YEAR			
First Semester			
10-412-138	Diesel Shop Management	2	3-0
10-412-176	Diesel Fuel Systems*	4	6-10
10-412-177	Diesel Engine Diagnostics**	2	1-2
10-412-178	Diagnostic Strategies	2	1-2
10-412-188	Electronic Control Systems**	2	2-4
	Semester Total	12	
Second Semester			
10-412-112	Mobile Hydraulics	3	2-3
10-412-125	Cab Climate Control/Refrigeration Systems	3	4-4
10-412-184	Diesel Engine Technology	2	2-4
10-412-185	Diesel Engine Repair	4	6-10
	Semester Total	12	

*First nine weeks of semester.
**Second nine weeks of semester.

Note: Students are placed in English or mathematics courses based on their scores on the COMPASS or ASSET test or on completion of the appropriate prerequisite/s.

Notes: Safety procedures required in all labs. Prerequisites can be waived with Center approval. Advanced standing may be granted by Center deans. Certain associate degree or higher post-secondary courses specific to the curriculum may substitute for courses upon approval of Center dean/program director.

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Program Courses

10-412-112 Mobile Hydraulics 3 credits
Prepares the student with the knowledge and skills needed to adjust, diagnose, service and repair mobile hydraulic systems found on trucks and construction equipment. Prerequisite: 10-412-140.

10-412-125 AC/Refrigeration Systems 3 credits
Lectures/labs provide skills to diagnose, maintain, and service air conditioning and transport refrigeration equipment found on truck trailers and off-road equipment. Prerequisites: 10-412-112 and 10-412-145.

10-412-137 Preventative Maintenance 4 credits
Students maintain and inspect fleet vehicles and equipment. Includes record keeping, computerized maintenance systems, automated shops and cost effectiveness.

10-412-138 Diesel Shop Management 2 credits
The student will gain the knowledge needed to function in a typical service department setting. The student will learn what it takes to manage a service department, the costs involved in running the department and the day-to-day problems that arise in the service department. General business operational procedures, record keeping and cost effectiveness will also be part of this course. Prerequisites: all first year courses or consent of program director

10-412-140 Introduction to Diesel Technology 1 credit
Includes a discussion of the job requirements, skills needed, career options, and employment opportunities in diesel equipment repair and maintenance. Introduces shop procedures, safety practices, tools and the use of service manuals. Prerequisites: Enrollment permitted only with adequate COMPASS(or equivalent assessment test) scores in reading, writing, math and mechanical reasoning.

10-412-144 Intro. to Diesel Electrical/ Electronic Systems 3 credits
Theory and laboratory experiences in this course are designed to introduce the student to the diesel electrical/electronic systems used on today's modern trucks and construction equipment. Basic theory of electricity and electronics, use of test equipment, types of electrical circuits, wiring, components, batteries and the use of wiring diagrams will be covered. Prerequisites: Enrollment permitted only with adequate COMPASS test scores in reading, writing, math and mechanical reasoning.

10-412-145 Electrical/Electronic Systems Diagnostics 3 credit
Theory and laboratory experiences in this course are designed to give the student the knowledge and skills needed to diagnose, service, and repair heavy-duty electrical systems found on today's modern trucks and off-road equipment. Corequisite: 10-412-144.

10-412-155 Heavy Duty Drivetrains 4 credits
This course prepares the student with the knowledge and skills needed to adjust, diagnose, maintain, service and repair heavy duty drivetrains found on trucks and construction equipment. Corequisite: 10-412-140.

10-412-164 Brake and Suspension Systems 4 credits
Prepares the student with knowledge and skills needed to adjust, diagnose, service, and repair heavy duty brake and suspension systems. Corequisite: 10-412-140.

10-412-176 Diesel Fuel Systems (9 weeks) 4 credits
Lectures and labs allow students to diagnose, service and repair heavy-duty electrical systems found on trucks and off-road equipment. Prerequisites: 10-412-140, 10-412-145 and completion of or concurrent enrollment: 10-412-112.

10-412-177 Diesel Engine Diagnostics 2 credits
Lectures and lab use the latest in diagnostic equipment to evaluate engine performance and diagnose power complaints on modern hydro-mechanic diesel fuel injection systems Prerequisite: 10-412-176.

10-412-178 Diagnostic Strategies 2 credits
Explores the logical thought process used analyzing and diagnosing system malfunctions and performance problems. Diagnostic and problem solving techniques will be included. Also included will be evaluating failures, classifying failures, problems and documentation of findings. Prerequisites: all first year courses or consent of program director

10-412-184 Diesel Engine Technology 2 credits
Study in this course will allow the student to develop a basic knowledge of design, construction and operating principles of the diesel engine. Service, maintenance and the types of repairs made on diesel engines and diesel engine support systems will be a major emphasis of the course. Prerequisite: 10-412-140.

10-412-185 Diesel Engine Repair 4 credits
Lectures and labs teach students to maintain, service and repair diesel engines and diesel engine support systems. The course also includes precision measuring, failure analysis and parts inspection. Prerequisite: 10-412-140. Corequisite: 10-412-184.

10-412-188 Electronic Control Systems 2 credits
This course provides the student with the experience needed to diagnose and service modern electronic control systems used on trucks and construction equipment. The course also includes electronic controlled diesel engines, ABS brake systems, electronic controlled transmissions, and other computer controlled electronic vehicle systems. Prerequisites: 10-103-133, 10-103-137, 10-412-155 and 10-412-164. Corequisite: 10-412-176.

10-442-126 Metal Repair Techniques 2 credits
This course covers safety, layout and measurement, grinding, drill press and lathe operation, filing, threading, properties of metals, oxy-acetylene welding, brazing and cutting, and SMAW, GMAW, GTAW and FCAW.

Additional required course descriptions may be found on the MATC Website.

Career Potential:

- **Diesel and Heavy Equipment Technicians**
  Diagnose, repair and service medium and heavy duty trucks, light and heavy construction equipment or agricultural equipment and machinery.
- **Fleet Maintenance Technicians**
  Keep records on fleet vehicles and perform general maintenance, inspections and repairs.
- **Fuel Injection Technicians**
  Diagnose, repair and service fuel systems and governing devices on all types of diesel engines.
- **Alignment Specialists**
  Use computerized alignment equipment to diagnose, repair and adjust medium and heavy duty truck suspension systems.
- **Engine Rebuild Specialists**
  Disassemble, inspect, reassemble and test engines to factory specifications with dynamometer.

With additional education and/or experience, graduates may find employment as:

- Service Writers or Managers
- Shop Foremen
- Team Leaders
- DOT Inspectors
- Factory Service Representatives
- Fleet Maintenance Managers

More detailed and updated information on this program may be available at: matcmadison.edu. The college reserves the right to make changes in the regulations and courses announced in this publication without notice.

Madison Area Technical College provides equal opportunity in education and employment.

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