

Diesel Equipment Technology

Program Number: 10-412-1

Associate in Applied Science Degree

Transportation Program Cluster

Center for Construction, Manufacturing, Apprenticeship & Transportation

Program offered at Madison Campuses

For information call: (608) 246-6102 or (800) 322-6282 Ext. 6102

About the Program

The associate-degree Diesel Equipment Technology program (Top Tech) is designed to meet the needs of today's diesel industry—which is rapidly changing due to electronically controlled systems, computers and on board diagnostics. Today's newest concerns are with diesel engine exhaust emissions. Dealerships and fleets need technicians with advanced diagnostic, troubleshooting and critical thinking skills. Top Tech, a Madison College-industry partnership, allows companies to sponsor students as paid interns. The on-the-job training builds technical expertise and helps students learn to use sophisticated equipment to diagnose and correct problems. In addition, the program's management and communication courses will help graduates qualify for promotions throughout their careers.

Trucking is one of the fastest-growing industries in the U.S. In Wisconsin, one out of seven people work in the manufacture, distribution, maintenance or commercial use of motor vehicles. Agriculture and construction are also major portions of Wisconsin's economy and require trained technicians to keep modern equipment up and running. All areas of the diesel industry are experiencing shortages of qualified technicians.

Students learn Automotive Service Excellence (ASE) and Association of Diesel Specialists (ADS) standards: to repair engines, transmissions, drivelines, electrical, electronic, hydraulic systems, fuel, brake, air conditioning and transport refrigeration systems; to adjust suspensions and align wheels and to perform maintenance and tune-ups. Students are trained in simulated shop environments and evaluated like actual employees.

The program is a National Automotive Technicians Education Foundation/NATEF/ASE master certified medium/heavy truck program, and certified as a "TECH SMART" school by ADS. The Association of Diesel Specialists provides scholarships and program support. This program also works with the "2001" Diesel Consortium of approximately 40 companies and developed the Top Tech educator/student industry partnership.

Application Process

To apply to the program, students must submit a complete application. A completed application consists of 1.) Application; 2.) Application fee; and 3.) High school transcripts – or - GED/HSED test scores – or – college transcript showing an Associate, Bachelor, or higher degree from an institution other than Madison College.

Unique Requirements for Admission

There are no unique requirements for admission to this program. Students will be required to have an employer sponsor for a work experience during the summer between the 1st and 2nd year.

Unique Requirements for Graduation

Students must meet two 2.0 GPA requirements to graduate. 1.) GPA for entire program must be 2.0 or above; 2.) GPA of combined occupational courses (412) must be 2.0 or above.

Curriculum

The courses listed below outline the requirements for graduation for students entering this program in the 2011-2012 academic year. Requirements for graduation may vary depending on the semester in which a student is admitted to their program. Current/continuing students should consult their degree progress report available through student center account for specific graduation requirements. Program requirements are subject to change.

FIRST YEAR		Credits	Hrs/week
First Semester			Lec-Lab
20-890-200	College Success	2	2-0
10-412-137	Preventive Maintenance Inspections	4	1-4
10-412-144	Fundamental Diesel Electrical/ Electronics Systems*	3	4-9
10-412-145	Electrical/Electronics Systems Diagnostics*	3	4-9
10-442-126	Metal Repair Techniques	2	2-2
10-804-107	College Math	3	3-0
Semester Total		17	
Second Semester			
10-412-112	Mobile Hydraulics	3	2-2
10-412-155	Heavy Duty Drivetrains*	4	4-14
10-412-164	Brake and Suspension Systems*	4	5-15
10-801-195	Written Communication	3	3-0
10-809-197	Contemporary American Society	3	3-0
Interim (register as part of spring/second semester)			
10-412-190	Diesel Equipment Lab Experience 1 •	1	1-35
Semester Total		18	
Summer Semester			
10-412-195	Occupational Experience (432 hrs.)	2	0-48
Term Total		2	
SECOND YEAR			
First Semester			
10-412-125	Cab Climate Control/Refrigeration Systems	3	2-3
10-412-184	Diesel Engine Technology	2	1-3
10-412-185	Diesel Engine Repair	4	4-10
10-801-197	Technical Reporting	3	3-0
10-806-139	Survey of Physics	3	2-2
Semester Total		15	
Second Semester			
10-412-176	Diesel Fuel Systems*	4	5-10
10-412-177	Diesel Engine Diagnostics*	2	3-5
10-412-138	Diesel Shop Management	2	2-0
10-412-178	Diagnostic Strategies	2	1-2
10-412-188	Electronic Control Systems	2	3-4
10-809-195	Economics	3	3-0
10-809-199	Psychology of Human Relations	3	3-0
Semester Total		18	

* Meets for 9 weeks.

• Meets for 1 week (36 hours).

Notes:

- Prerequisites can be waived with program director approval.
- Advanced standing may be granted by the program director and Center dean.
- Certain associate degree or higher post-secondary courses specific to the curriculum may substitute for courses upon approval of program director and Center dean.
- Entrance at nine-week intervals with advanced standing and approval of Center dean.

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.



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.

10-412-125 Cab Climate Control/Refrigeration Systems 3 credits
Lectures/labs provide skills to diagnose, maintain and service cab climate control and transport refrigeration equipment found on truck trailers and off-road equipment. Pre or co-req: Mobile Hydraulics (10-412-112).

10-412-137 Preventative Maintenance Inspections 4 credits
This course will provide the opportunity to perform preventive maintenance inspections and conduct minor repairs on heavy-duty trucks and equipment. Also included will be preparation for taking both the written portion and practical Commercial Driver's License (CDL) test. As part of the course requirements, students will take the written tests at the Department of Motor Vehicles (DMV) test center. Co-req: Fundamental Diesel Electrical/Electronic Systems (10-412-144).

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. Pre-req: All first year Diesel (412) courses.

10-412-144 Fundamental Diesel Electrical/ Electronic Systems 3 credits
Theory and lab 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. Fundamental theory of electricity and electronics, troubleshooting techniques, use of digital multimeter and current clamp, types of electrical circuits, wiring, components, batteries and the use of wiring diagrams will be covered.

10-412-145 Electrical/Electronic Systems Diagnostics 3 credits
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. Coreq: Fund. Diesel Elec. (10-412-144). Students must receive a C or higher in Fund. Diesel Electrical (10-412-144) to continue into this course.

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.

10-412-164 Brake and Suspension Systems 4 credits
Prepares the student with the knowledge and skills needed to adjust, diagnose, service and repair heavy duty brakes, and suspension systems. Students will also perform vehicle alignment procedures and utilize various alignment equipment.

10-412-176 Diesel Fuel Systems 4 credits
Lectures and labs allow students to diagnose, service and repair diesel fuel systems found on trucks, and agricultural equipment. Pre-req: All first year Diesel (412) courses.

10-412-177 Diesel Engine Diagnostics 2 credits
Lectures and labs use the latest in diagnostic equipment to evaluate engine performance and diagnose power complaints on mechanical and computer controlled diesel fuel injection systems. Pre-req: All first year Diesel (412) courses. Co-req: Electronic Control Systems (10-412-188)

10-412-178 Diagnostic Strategies 2 credits
Explores the logical thought process used analyzing and diagnosing system malfunctions and performance problems. Practical hands-on experiences of diagnostic and problem solving techniques will be included. Also included will be evaluating failures, classifying failures, problems and documentation of findings. Pre-req: All first year Diesel (412) courses, including a grade of C or higher in Electrical Systems Diag (10-412-145).

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. Pre-req: All first year Diesel core (412) courses. Co-req: Diesel Engine Repair (10-412-185).

10-412-185 Diesel Engine Repair 4 credits
Lectures and labs teach students to maintain, service and repair diesel engines and engine support systems. The course also includes precision measuring, failure analysis and parts inspection. Pre-req: All first year Diesel core (412) courses. Co-req: Diesel Engine Technology (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 includes electronic controlled diesel engines, ABS brake systems, electronic controlled transmissions and other computer controlled electronic vehicle systems. Pre-req: All first year Diesel (412) courses. Co-req: Diesel Engine Diagnostics (10-412-177). Students must complete Diesel Engine Diagnostics in the 1st 9 weeks to continue into this course.

10-412-190 Diesel Equipment Lab Experience 1 1 credit
Students service various trucks, construction and industrial equipment. Emphasizes daily shop operations, procedures and safe work habits. Simulated on-the-job experiences develop and apply students' knowledge and skills. Pre-req: All first year program courses.

10-412-195 Occupational Experience 2 credits
As interns, students work on electrical/electronic systems, vehicle and equipment maintenance, heavy duty brakes, suspensions, drive trains and general shop maintenance. Types of jobs and competencies employed may vary depending on what area of the industry the employer represents. Technical competencies for this course may be performed either alone, as an experienced technician's helper or a combination thereof. Pre-req: All first year program courses.

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.

Career Potential:

- **Diesel Equipment Technicians**
Use sophisticated equipment to analyze and adjust engine performance and do tests and service to meet emissions standards.
- **Electronic Systems Diagnostic Specialists**
Test, analyze, service and repair computerized and electronic systems.
- **Engineering Assistants**
Work with engineers and manufacturers to test and adjust prototype engines and equipment.
- **Field Service Representatives**
Are experts on specific equipment. Travel to dealerships to solve unique problems.
- **Assistant Service Managers**
Assist manager, meet customers and help technicians diagnose problems.
- **Fleet Maintenance Managers**
General maintenance, scheduling, inspections, repairs and keeping vehicle records.

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

- **Service Writers or Managers**
- **Shop Foremen**
- **Team Leaders**
- **DOT Inspectors**
- **Factory Service Representatives**
- **Equipment Sales Specialists**
- **Research and Development Technicians**

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

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