

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 is designed to meet the needs of today's diesel industry—which is being rapidly changed by computers and electronics. Diesel companies need technicians with advanced diagnostic, troubleshooting and analysis skills. Top Tech, a MATC-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 ASE and ADS standards: to repair engines, transmissions, drivelines and electrical, electronic, hydraulic, fuel, brake, air conditioning and transport refrigeration systems; to adjust suspensions and align wheels and to perform maintenance and tune-ups. A competency checklist is used to track tasks learned. Students are trained in simulated shop environments and evaluated like actual employees.

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

Requirements for Admission

1) A TOP TECH industry sponsor; 2) high school diploma or equivalent with recommended courses in math, science, agriculture or industrial education. Mechanical experience may be helpful.

Curriculum

FIRST YEAR

First Semester		Credits	Hrs/week Lec-Lab
10-890-100	College Student Success OR	2	2-0
20-890-200	College Success	(2)	(2-0)
10-412-137	Preventive Maintenance	4	1-4
10-412-144	Introduction to Diesel Electrical/ Electronics Systems*	3	6-10
10-412-145	Electrical/Electronics Systems Diagnostics**	3	4-10
10-442-126	Metal Repair Techniques	2	1-2
10-804-110	Elem Algebra w/Apps	3	3-0
Semester Total		17	

Second Semester

10-412-112	Mobile Hydraulics	3	1-4
10-412-155	Heavy Duty Drivetrains**	4	4-12
10-412-164	Brake and Suspension Systems*	4	4-12
10-412-190	Diesel Equipment Lab Experience 1†	1	0-2
10-801-195	Written Communication	3	3-0
10-804-113	College Technical Math 1A	3	3-0
Semester Total		18	

Summer Semester

10-412-195	Occupational Experience (432 hrs.)	2	0-48
Total		2	

SECOND YEAR

First Semester

10-412-125	Cab Climate Control/Refrigeration Systems**	3	4-4
10-412-184	Diesel Engine Technology	2	1-3
10-412-185	Diesel Engine Repair	4	1-8
10-801-197	Technical Reporting	3	3-0
10-412-138	Diesel Shop Management	2	2-0
10-806-139	Survey of Physics	3	2-2
Semester Total		17	

Second Semester

10-412-176	Diesel Fuel Systems*	4	6-10
10-412-177	Diesel Engine Diagnostics**	2	1-2
10-412-178	Diagnostic Strategies**	2	2-4
10-412-188	Electronic Control Systems	2	1-2
10-809-195	Economics	3	3-0
10-809-199	Psychology of Human Relations	3	3-0
Semester Total		16	

*Offered during the first nine weeks of the semester.

**Offered during the second nine weeks of the semester.
†1 week/36 hours.

Notes: Prerequisites can be waived with program director approval. Advanced standing may be granted by the dean/program director. Certain associate degree or higher post-secondary courses specific to the curriculum may substitute for courses upon approval of your dean/program director. 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 prerequisites.

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: Intro To Diesel Technology, 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: Mobile Hydraulics, 10-412-112 and Electrical/Electronics Systems Diagnostics, 10-412-145.

10-412-137 Preventative Maintenance 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.

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.

10-412-144 Introduction 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 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. Corequisite: Introduction to Diesel Electrical/ Electronics Systems, 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: Intro To Diesel Technology, 10-412-140.

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 brake and suspension systems. Corequisite: Intro To Diesel Technology 10-412-140.

10-412-176 Diesel Fuel Systems 4 credits
Lectures and labs allow students to diagnose, service and repair heavy-duty electrical systems found on trucks and off-road equipment. Prerequisites: Intro To Diesel Technology, 10-412-140 and Electrical/Electronics Systems Diagnostics, 10-412-145 and completion of or concurrent enrollment: Mobile Hydraulics, 10-412-112.

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 modern hydro-mechanical diesel fuel injection systems. Prerequisite: Diesel Fuel Systems, 10-412-176.

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. Prerequisites: all first year courses or consent of program director.

10-412-184 Diesel Engine Technology 2 credits
Students develop basic knowledge of design, construction and operating principles of the diesel engine. The course emphasizes the service, maintenance and the types of repairs made on diesel engines and diesel engine support systems. Prerequisite: Intro To Diesel Technology, 10-412-140.

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. Prerequisites: Intro To Diesel Technology, 10-412-140. Corequisite: 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. Prerequisites: Excel – Beginning, 10-103-133, Word – Beginning, 10-103-137, Heavy Duty Drivetrains, 10-412-155, and Brake and Suspension Systems, 10-412-164. Corequisite: Diesel Fuel Systems, 10-412-176.

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. Prerequisite: all first semester courses or consent of program director.

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. Prerequisites: all first year courses or consent of the program director.

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**
Are responsible for 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: matcmadison.edu. The college reserves the right to make changes in the regulations and courses announced in this publication without notice.