

# Diesel/Heavy Equipment Technologies



The mission of the Diesel/Heavy Equipment program is to teach students the skills and competencies of servicing, maintaining, and repairing construction machinery and diesel engines.

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**Length of Course:** 1,281 clock hours, 197 training days

**Enrollment:** August and January

**Training Hours:** 8:30 a.m. to 3:30 p.m., Monday through Friday

**Certificate Level:** Diesel/Heavy Equipment Technologies

**Occupational Levels:**

Diesel/Heavy Equipment Technician Level 3/Entry Level Tech

Diesel/Heavy Equipment Technician Level 2/Assistant

Diesel/Heavy Equipment Technician Level 1/Oiler

## Program Accreditations:

AVTEC's Diesel/Heavy Equipment Technologies program is accredited by the Associated Equipment Distributors (AED) Foundation.



## Industry Certifications:

In addition to the Diesel/Heavy Equipment Technologies certificate, students can also prepare for and earn ASE certifications.

## Prerequisites:

**Good math and reading skills are important.** For specific information on entry guidelines in reading and mathematics for this program, contact the Admissions Office at (800) 478-5389.

**TABE tests scores for this program must be:**

<b>Reading</b>	552
<b>Combined Math</b>	552

Physical requirements of the occupation are the ability to lift 100 pounds, carry 50 pounds, stoop, kneel, crawl, walk, and stand continuously. The work also requires good finger dexterity.

Students will need to provide their own tools.

# Diesel/Heavy Equipment Technologies

Normally, half the investment of a mining, construction, or logging business is in equipment. Good preventive maintenance is a priority and contributes to the success of the business.

The hands-on approach to AVTEC's Diesel/Heavy Equipment Technologies program helps students learn how to service, maintain, and repair equipment ranging from dump trucks to bulldozers. As most equipment is powered by diesel engines, students will disassemble, measure, and reassemble engines to factory specifications. Because of the complexity of this equipment, students should have good mechanical aptitude, and **strong reading and mathematics skills**, and should also possess a desire to succeed.



Approximately 60 percent of the course is shop work and 40 percent is classroom instruction. Instruction is individualized so that students may progress at their own rate. **Good reading and math skills are essential.**

The nature of the training requires that students work outdoors. Warm clothing, rain gear, and proper boots are required. Construction equipment such as dump trucks, road graders, front-end loaders, back hoes, bulldozers, and a large transport truck are utilized by students developing mechanical skills.

## Earn College Credit While Attending AVTEC

Diesel/Heavy Equipment Technologies program graduates may earn 26 University of Alaska college credits towards the requirements of an Associate of Applied Science Diesel Technology Degree.

## Program Requirements

Occupational levels of Technician Level 3, Technician Level 2, or Technician Level 1 will be assigned upon successful completion of the training program based on the student's proficiency of the program's competencies.

To achieve a Diesel/Heavy Equipment Technologies certificate, students must complete the following requirements: Related Studies, General, Brakes, Tire Repair, Chassis Components, Electrical, Transmissions, Hydraulic Systems, Engines, Fuel Systems, Engine Lubrication, Cooling Systems, Intake Systems, Undercarriage, Governors, Arc and Gas Welding, and Education/Technical Knowledge. This is a total of 1,281 contact hours.

### Related Studies

Contact Hours: 75

Participate in school safety orientation, complete achievement tests, obtain First Aid & CPR card, complete applied math class and computer skills practice, participate in resume writing and job search training, participate in interview and communications training.

### General

Contact Hours: 55

Identify, use, and maintain basic shop tools, demonstrate the proper use of hand tools and basic power tools, define and apply mechanic terminology, identify common fasteners, read tap and thread chart and perform basic tapping and threading, identify and use precision measuring tools.

### Brakes

Contact Hours: 97

Describe the design and operation of air and hydraulic brake systems, describe air and hydraulic supply system and service, truck rear axle brake application system and service, trailer brake application and service, tractor steering axle brake application system and service; service hydraulic and air brakes on truck or loader.

### Tire Repair

Contact Hours: 20

State safety issues and demonstrate proficiency in the repair of tires, service and repair a large truck and loader tire.

### **Chassis Components**

Contact Hours: 115

Service car, truck, and heavy equipment tires, remove and replace vehicle clutch, repack and adjust wheel bearings, disassemble and reassemble 3- and 4-speed transmissions, disassemble, reassemble and adjust differential assembly, diagnose and repair chassis and suspension components.

### **Electrical**

Contact Hours: 60

Service batteries, troubleshoot and repair vehicle wiring and lighting systems, service ignition systems, including tune-up, timing and repair, explain the basic theory of ignition system operations, service starters; including bench testing rebuilt units, explain theory of starting system operations and generator/regulator system operations, service alternators; including bench testing rebuilt units, explain theory of alternator system operation.

### **Transmissions**

Contact Hours: 65

Describe the construction, operation, inspection and maintenance of the standard transmission, describe service procedures for standard transmissions, Describe the construction, operation, inspection and maintenance of the automatic transmission, service a standard and an automatic transmission.

### **Hydraulic Systems**

Contact Hours: 50

Identify hydraulic components, understand basic pumps, explain hydraulic principles, demonstrate industrial applications and hydraulic troubleshooting.

### **Engines**

Contact Hours: 465

Identify different diesel engines, explain the basics of diesel engine functions, demonstrate basic repair practices, disassemble engines, clean and inspect all part, inspect and measure all parts for wear using manufacturers' specifications, grind valves and seats, explain camshaft functions, measure, knurl or replace valve guides, replace engine bearings and measure clearance, install cylinder liners, fit pistons to connecting rods, correctly install piston rings, assemble engine and all associated parts, test run and adjust engine to specifications, troubleshoot various engine problems.

### **Fuel Systems**

Contact Hours: 45

Inspect fuel systems, identify fuel system components, understand fuel system flow, demonstrate fuel filter replacement, demonstrate fuel system bleeding procedure, troubleshoot fuel system problems, install and time fuel injection pumps, remove and install fuel injectors, clean and adjust fuel injectors, basic understanding of computer controlled injection pumps and fuel injectors.

### **Engine Lubrication**

Contact Hours: 20

Explain Automated Precision, Inc. Oil classification system, working knowledge of oil filters and filtration systems, working knowledge of oil pumps and oil supply, understand oil coolers.

### **Cooling Systems**

Contact Hours: 20

Correctly identify all parts of cooling system, understand functions of a water pump and pump development, understand workings of a thermostat, inspect and test heat exchangers, correct use of antifreeze.

### **Intake Systems**

Contact Hours: 10

Understand intake manifolds, air filters and air filtration system, inspect and service air intake systems.

### **Undercarriage**

Contact Hours: 90

Remove and replace track on crawler tractor, disassemble and reassemble final drive on crawler tractor, remove, repair and install swing frames on a crawler tractor, replace cutting edges on blade, use torch, porta-power, and/or hydraulic press to straighten parts on equipment, jack up and install blocking or jack stands on heavy equipment.

### **Governors**

Contact Hours: 30

Identify, test, and properly maintain various governors.

### **Arc and Gas Welding**

Contact Hours: 30

Perform basic solder, braze, oxy-acetylene cutting and welding techniques.

### **Education/Technical Knowledge**

Contact Hours: 44

Write up parts list, carry out instructions furnished in written, oral or diagrammatic form, read manuals and apply to work situation, apply mechanics math as required.