

# Diesel Technology (DSL T)

## Community & Technical College

Diesel & Heavy Equipment Program (<https://www.ctc.uaf.edu/programs/diesel-heavy-equipment/>)  
907-455-2800

### DSL T F101 Safety Including Rigging and Lifting

1 Credit

Offered Fall

This course is an introduction to working safely in a shop environment. Discussions and practical exercises cover the proper use of personal protective gear and air ventilation systems; identifying harmful chemicals and interpreting Safety Data Sheets; procedures for lifting heavy items; use of power and hand tools.

**Lecture + Lab + Other:** 1 + 0 + 0

**Grading System:** Letter Grades with option of Plus/Minus

### DSL T F103 Basic Equipment and Truck Operation

1 Credit

Offered Fall

Basic operation of heavy equipment and diesel trucks to include: stator, clutching, braking, and steering procedures. Basic forklift operation to include: lifting weight, calculation and point of balance of machine versus lifting load.

**Lecture + Lab + Other:** 0.5 + 1.5 + 0

**Grading System:** Letter Grades with option of Plus/Minus

### DSL T F105 Preventive Maintenance

3 Credits

Offered Fall

Perform scheduled preventive maintenance on vehicles and heavy equipment. Gain knowledge of lubricants, filters, lubrication points and proper fluid levels and understanding of what to look for when performing a visual inspection.

**Prerequisites:** DSL T F101; DSL T F103.

**Lecture + Lab + Other:** 1.5 + 3 + 0

**Grading System:** Letter Grades with option of Plus/Minus

### DSL T F107 Basic Electrical Systems

3 Credits

Offered Fall

Basic electrical theory and DC voltage and amperage is followed by battery operation and testing. Circuit protection and control will also be covered culminating in reading and writing electrical schematics as well as identification, testing and repair of basic circuits.

**Lecture + Lab + Other:** 1.5 + 3 + 0

**Grading System:** Letter Grades with option of Plus/Minus

### DSL T F108 Advanced Electrical Systems

3 Credits

Offered Fall

Theory, operation and repair of starting and charging systems, diagnostic methods and specifications that are standard in the industry. Diagnosis and repair of common sensors, actuators, electronic fuel injectors and systems will be covered, as well as electronic scan tools, multiplexing and CAN Bus network diagnosis and repair.

**Lecture + Lab + Other:** 1 + 4 + 0

**Grading System:** Letter Grades with option of Plus/Minus

### DSL T F110 Basic Industrial Fabrication

2 Credits

Offered Fall

Students will learn the concepts of industrial fabrication. When working with heavy equipment, things can break. This class will teach the basics of how to fabricate and repair heavy equipment in and out of the field using various techniques.

**Prerequisite:** Department or Instructor approval required.

**Lecture + Lab + Other:** 1 + 2 + 0

**Grading System:** Letter Grades with option of Plus/Minus

### DSL T F111 Diesel Emissions

2 Credits

Offered Spring

Diesel engine emissions concepts and their air pollution contribution. Knowledge to create cleaner-running diesel engines, promote pollution-control technology, prevent unnecessary idling, and make diesel engine smoke puff an extinct image. Study/practice diesel emission-reducing actions using measuring devices, learn catalytic converter/particulate filter terms and technologies, exhaust fluid usage, troubleshoot emission components.

**Prerequisite:** Department or Instructor approval required.

**Lecture + Lab + Other:** 1 + 2 + 0

**Grading System:** Letter Grades with option of Plus/Minus

### DSL T F123 Heavy Duty Braking Systems

3 Credits

Offered Fall

Commercial trucks/heavy equipment braking systems applications; compressor testing/overhaul, relay valves, actuators, wear limits, acceptable tolerances, brake lining replacement, government regulations and pneumatic controls; evolving technologies such as anti-lock brakes. Remove/replace brake shoes, drums, hardware, S-cams and air chambers. Includes inspection, preventive maintenance and a commercial truck/heavy equipment braking system overhaul.

**Prerequisites:** DSL T F101; DSL T F103.

**Lecture + Lab + Other:** 1.5 + 3 + 0

**Grading System:** Letter Grades with option of Plus/Minus

### DSL T F154 Diesel Fuel Injection

3 Credits

Offered Spring

Theory and functional operation of all common diesel fuel injection systems including modern Bosch, Mack, Cummins, Caterpillar and Detroit Diesel. Direct injection and pre-combustion fuel injection systems. Testing procedures, when testing high pressure diesel injection pumps and injectors; removing, installing and adjusting common systems used in the heavy truck/equipment industry.

**Lecture + Lab + Other:** 2 + 2 + 0

**Grading System:** Letter Grades with option of Plus/Minus

### DSL T F201 Manual Transmissions and Differentials

3 Credits

Offered Spring

Theory, diagnosis and repair of manual transaxles and transmissions, transfer cases, differentials, clutch assemblies, power take off units, driveshafts and axles as well as removing and installing clutches, transmissions and differentials in a truck or piece of heavy equipment. Preventive maintenance and cold weather component problems will also be covered.

**Prerequisites:** DSL T F101; DSL T F103.

**Lecture + Lab + Other:** 1 + 4 + 0

**Grading System:** Letter Grades with option of Plus/Minus

**DSLTL F202 Heavy Duty Automatic Transmissions**

2 Credits

Offered Spring

Theory, operation and troubleshooting of heavy duty automatic transmissions; hydraulic, electrohydraulic, pneumatic and electronic controls. Prepares the student to overhaul Allison, ZF and similar automatic transmissions.

**Lecture + Lab + Other:** 1 + 3 + 0

**Grading System:** Letter Grades with option of Plus/Minus

**DSLTL F210 Heavy Equipment Fabrication**

2 Credits

Offered Spring

Students will learn advanced concepts of industrial fabrication in the maintenance of heavy duty equipment, develop a strong understanding of metals and their applications, and have the ability to bend, heat, and apply welding techniques that will support heavy duty equipment for long term use.

**Prerequisite:** Department or Instructor approval is required.

**Lecture + Lab + Other:** 1 + 2 + 0

**Grading System:** Letter Grades with option of Plus/Minus

**DSLTL F212 Hydraulics**

3 Credits

Offered Spring

Theory of fluid power and the components that make up a hydraulic system found on heavy equipment. Identification and description of hydraulic cylinders, motors, directional valves commonly found on heavy equipment. Includes testing of equipment and performing hydraulic pressure and flow tests.

**Prerequisites:** DSLTL F101; DSLTL F103; DSLTL F105.

**Lecture + Lab + Other:** 1 + 4 + 0

**Grading System:** Letter Grades with option of Plus/Minus

**DSLTL F254 Engine**

6 Credits

Offered Spring

Theory and operation of the two-cycle and four-cycle diesel engine injection and combustion process. Operation and maintenance of internal components and systems including tune-ups and fuel system troubleshooting, culminating in disassembly and reassembly of a large bore diesel engine commonly found in heavy trucks or heavy equipment.

**Prerequisites:** DSLTL F101; DSLTL F103; DSLTL F105.

**Lecture + Lab + Other:** 2.5 + 6.5 + 0

**Grading System:** Letter Grades with option of Plus/Minus