

## DSLTF111 – DIESEL EMISSIONS

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**Instructor:** Brian Rencher

**Class Dates:**

**Room:** 147 Hutch

**Office Hours:** 2:00pm – 9:00pm

**Office Phone:** 907-455-2843

**Cell Phone:** 907-460-6332

**E-mail:** [bkrencher@alaska.edu](mailto:bkrencher@alaska.edu)

**Hours:** Monday – Friday

Theory 3:00pm – 5:00pm

Dinner 5:00pm – 5:30pm

Shop/Lab 5:30pm – 8:30pm

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### Supplies required:

Reading material: Medium and Heavy Duty Truck Engines  
Fuel and Computerized Management Systems

Misc hand tools: Per handout

Protective clothing: Coveralls with sleeves

Protective footwear: Above ankle boots

Eye protection: Safety glasses

Misc materials: Paper pad and pen (for instructions)

### Course goals:

Students will learn the concepts of diesel engine emissions and how diesel emissions significantly contribute to air pollution. Knowledge of how to create cleaner running diesel engines, promote pollution-control technology, prevent unnecessary idling, and ultimately, make that puff of smoke that can come from these engines an image of the past. We will study and practice the actions taken to reduce diesel emissions using measuring devices, learn the terms and technologies of catalytic converters, particulate filters, the use of diesel exhaust fluid, and be able to troubleshoot emission components.

### Course objectives:

Upon completion of this course, the student should have the following:

1. Learn about emission federal standards and it affects
2. Health and environmental effects of emissions
3. What the different exhaust smoke colors indicate
4. Measuring emissions/ambient diesel aerosols
5. How other components contribute to bad emissions
6. Emissions effect on engine faults and service
7. Servicing and replacing vehicle emission components

### Course policies:

- Cell phones are not permitted during class hours (theory or shop/lab).
- A thirty minute break will be given between theory and shop/lab at 5:00pm. This thirty minute break for lunch is the only allowable breaks without instructor's permission.
- No smoking inside the building or on school property at any time (per CTC/Hutchison Policy)
- All students are governed by the UAF Student Code of Conduct as it is applicable.
- Safety glasses are to be worn at all times in the shop area.
- Textbook, paper pads and pen are to be brought to class every day.
- During a fire alarm, students will gather in the CTC parking area with others from the class and will stay there until authorized by the instructor.
- Students are required to use a time clock when starting the day, going to lunch, returning from lunch and ending the day. Students are also required to keep a daily log of shop/lab projects. This will be discussed on a weekly basis between student and instructor as well as the previous week's grading point.
- Each student is responsible for documenting requirements on procedures in the shop/lab. (Example: When given instruction on a project, it is the student's responsibility to write down the given tasks.)
- All CTC shop tools are to be signed out by the daily assigned Forman of the shop and are to be returned at the end of each day to the instructor/Forman.
- Students are required to be working the entire time while in shop/lab. If your task is complete, you are expected to clean the shop, study text book or service manual, or ask the instructor for a task to fill in time.
- Each student is responsible for cleaning their own work area on a daily basis and keeping it clean and orderly throughout the day. No students are to remove coveralls or leave for the day until the entire shop is clean and authorized by the instructor/Forman.
- When lifting any item over an estimated 40 lbs, ask instructor for approval.
- When using the overhead hoist, cranes, roll around picking hoist or forklift for lifting, you **MUST** get instructors approval of the rigging before lifting.
- Any student that is injured during class is required to inform the instructor immediately, no matter how minor the injury.
- No earphones or personal music devices are allowed during class theory or shop/lab.
- Students that do not follow the above outlined regulations can be withdrawn from the diesel program by the instructor.

**The following is the grading scale for this class:**

Attendance				25%
Instructor Evaluation/Hands on Performance				25%
Exams				50%
GRADE POINTS				
A > 90%	B = 85% - 89%	C = 80% - 84%	D = 70% - 79%	F < 69%

**Grading policies:**

- 80% Attendance is required.
- 25% of your grade will be based on attendance, participation and completed engine performance based on the instructor's evaluation.
- 25% of your grade per week is determined by a once-a-week exam quiz, either written or verbal.
- Grading safety is an important part of this course and this industry, therefore any safety violations will result in a loss of 50% of daily points.
- A student, who is unable to attend class, should call and inform the instructor before class starts or make previous arrangements. This will allow students two points for the missed day. Otherwise zero points will be given for the missed day. Students can call office at 455-2843 if the instructor is not able to be reached.
- If a student is absent, it is their responsibility to get the information that was covered during their absence. The student is expected to take the weekly test/exam at the same time as all the other students in the class regardless of absenteeism.
- Exams/quizzes will be given once a week. Any make-ups will be dealt with on an individual basis.
- Tardiness is defined as up to one hour from class start time and will result in a loss of two points for the day.

This system cannot be altered after the first class meeting.

**NOTICE TO STUDENTS**

**Support Services**

The following services are available to all students: The Writing Center (8<sup>th</sup> floor, Gruening, 474-5314) and the Math Lab (305 Chapman), both of which provide excellent advice, tutoring and assistance; and/or Office of Student Support Services (508 Gruening, 474-6844). Also available is the Student Assistance Center at CTC which offers many services such as: academic advising, placement testing, career assessment, career counseling, computer support, math labs, tutors/tutoring, and a writing center. The center is located at 604 Barnette St. and is open M-F from 8am-5pm. For more info contact the center at 455-2899.

**Disabilities Services**

The office of Disability Services, 204 WHIT, 474-7043, implements the Americans with Disabilities Act (ADA), and insures that UAF Students have Equal Access to the campus and course materials. The CTC Office of Student Assistance can also help you if you have any of these concerns. Contact them at 455-2899 if you need help.

### **UAF Disability Services for Distance Students**

UAF has a Disability Services office that operates in conjunction with the Community and Technical College. Disability Services, a part of UAF's Center for Health and Counseling, provides academic accommodations to enrolled students who are identified as being eligible for these services.

Any student who feels discouraged or disappointed with instruction, curriculum or other, please notify the Diesel Coordinator, Brian Rencher at 907-455-2843 or the Student Assistant Coordinator, Michelle Stalder at 907-455-2849.

### **EMERGENCY PROCEDURES**

1. Evacuation procedures – see instructions posted in the classroom.
2. First aid kit – located in Equipment Shop 147.
3. Emergency ambulance – from any available telephone, phone “9” to get an outside line, then “911.” Campus Police – phone 474-7721      In an “Emergency” dial “911”

### **COURSE OUTLINE:**

Day 1: Go over Syllabus

Theory: Need for emissions; EPA; EPA standards; diesel fuels; emission control devices

Day 2: Review chapter 47

Video

Lab: Find and identify emission control devices and components on truck and heavy equipment in the shop

Day 3: Review chapter 47

Questions at end of chapter as class discussion

Theory: ‘DPF’ Diesel particulate filter; catalytic converters; regeneration cycles

Lab: Remove and inspect catalytic converters, and DPF, then reinstall and test

Day 4: Theory: Electronic control and monitoring of emission devices

Lab: Demonstration by instructor of using diagnostic tools to access and evaluate emission devices on trucks and equipment in the shop

Day 5: Review electronic monitoring systems and using electronic diagnostic equipment

Lab: Students will use electronic diagnostic equipment to monitor devices on truck and equipment in the shop while vehicles are running

**Test:** Emission devices, their need and use, and location on vehicles

Day 6: Theory: on use of diesel exhaust fluid and its uses

Lab: students monitor how a system using DEF works and the location of components of

this system as well as checking and filling this fluid

Day 7: Theory: Smoke; identifying different types of exhaust smoke and understanding what the color and amount relate to in engine components and emission control devices

Lab: Students monitor trucks and equipment while instructor makes changes to alter the smoke color and amount

Day 8: Review exhaust smoke and all other subjects covered in the past 7 days

NO Lab

Day 9: All Lab: Exercise of identification of emission control items and their function

Using electronic diagnostics in testing engine and emission devices

Exercise changing fuel setting and seeing the effects in the exhaust smoke

Day10: **Test:** Written and hands on

I \_\_\_\_\_ have received a copy of the  
DSLTT F111 “Diesel Emissions” class syllabus and have read  
and understand the class rules and testing procedures.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Instructor's signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Student's signature