

**COURSE # DMT 112L**

Diesel Engine Operation/Tune-up Lab

**Instructor**

**Instructor:**

**Phone:**

**Email:**

**Office Hours:**

**Course**

**Course Description**

Continues the study of engine components, operating systems, and performance factors. Provides opportunity to perform hands-on component replacement and tune-up adjustments. Provides the opportunity to run an engine under load in a dynamometer test cell. Emphasizes basic engine operating factors and troubleshooting complaints, such as low power, smoke conditions, engine faults, etc.

## Pre-requisites

This course **MUST** be taken concurrently with DMT 1120, Diesel Engine Operation/Tune-up Theory (4 credit hours). It is strongly recommended that a student have a minimum ACT or Compass reading score of 16 or higher. Students need to have good reading comprehension and math skills, as they will be required to follow detailed written procedures, measure engine components, and calculate clearances.

## Attention Students with Disabilities

Students needing accommodations due to a disability, including temporary and pregnancy accommodations, should contact Accessibility Services at [accessibilityservices@uvu.edu](mailto:accessibilityservices@uvu.edu) or 801-863-8747 located in LC 312. To request ASL interpreters, please contact Katie Palmer at [kateip@uvu.edu](mailto:kateip@uvu.edu). **See also the unique requirements listed in section 6 item 4 and the physical requirements in section 7 and 9.**

## Required textbooks or supplies

1. Safety glasses.
2. Basic Tool Bundle and all of your own hand tools. (See instructor for minimum tool list)
3. Official UVU Diesel Program green work shirt.
4. Coveralls, or other suitable work clothes, and leather shoes suitable for lab work.
5. The department will furnish all shop manuals and specialty service tools.
6. UVU ID to be able to check tools out of the tool room.
7. **NOTE: UVU will not be responsible for loss or damage of personal or tool room tools.**

## Course Objectives

1. Attend class, be on time, and work productively every day in preparation for employment in a shop
2. Practice & develop basic shop skills using hand & measuring tools and shop equipment.
3. Demonstrate skill using Cummins QSOL, Detroit Diesel PSL, & Cat SIS online service & parts programs to identify engines and components, and look up factory service procedures.
4. What is it? Where is it? How does it work? The primary goal of both theory and lab classes is to be able to identify & memorize the common parts and systems found on a diesel engine and locate them.
5. Identify & correctly torque standard and metric fasteners & fittings used on diesel engines.
6. Use hand tools & specialized service tools to disassemble, reassemble, and correctly adjust components.
7. Following written service procedures, use micrometers, dial indicators, calipers, bore gauges, and other precision tools to measure components and evaluate for reuse, correct fit, or tolerances.
8. Demonstrate knowledge and a systematic approach to troubleshooting engine component failures.
9. Demonstrate comprehension and proficiency to execute the lab tasks on **a timed lab final**

## Required Assignment

1. Complete all items on the lab task list (a separate sheet) and **repeat to become proficient**.
2. Maintain shop cleanliness. (See the attached shop cleanup sheet)
3. Perform any related "live work" or lab training projects as assigned.
4. Each student has a unique rate of comprehension, skill level, and commitment to this course, and may have a desire to work at their own pace. **YOU MAY FIND IT NECESSARY TO SPEND ADDITIONAL TIME AFTER CLASS** in order to become **proficient** with your lab tasks to a level of skill that you can be successful on the **TIMED** lab final**. FAILURE TO PUT IN THIS ADDITIONAL TIME MAY RESULT IN AN UNSATISFACTORY OR FAILING GRADE ON THE LAB FINAL.**

## Skills Required

Math 1260 & English 1060 or higher levels, good hand eye coordination, above average mechanical ability, the ability to solve problems, and follow detailed written & verbal procedures as outlined in service manuals. Good math skills are required to use precision measuring tools.

Students must also **demonstrate the ability to work independently**. To have a successful training experience and future job success as a diesel technician, students must have the **ability to lift at least 80 lbs., do strenuous work for at least eight hours per day, and climb on, off, and under equipment repeatedly.**

## Policies and Procedures

**Attendance:** Everyone is required to punch a time card to clock in at the beginning of class, and clock out at the end of each day. No one is allowed to clock in or out for anyone else. **Anyone who chooses to clock in or out for someone else can be deducted one letter grade.** 15% of your total lab grade comes from attendance. 100 points is given per block and you will lose points for each day you miss. If you leave class early without making prior arrangements, you will be marked absent or early out depending on the time you leave. **Not punching out will be marked NPO and points are deducted as” absent for lab.”** If you forget to punch out, you are responsible to get me to sign your time card **THE NEXT DAY** to get credit for being here. The time cards are two sided and **it is your responsibility** to make sure that I receive your completed time card at the end of each week. See the grading scale under section 12 for further clarification. In the UVU diesel program, attendance and being on time to class is a significant part of your grade, and is treated very much like regular employment.

**Late Policy:** Coming to class on time represents 7% of your grade. Again, the time clock is used to determine whether or not you are on time. You are considered “On Time” if your first punch for the day is at 7:00am or earlier. 7:01am or after is considered late. See the grading scale under section 13 for further clarification.

## Mandatory Lab Rules

1. Follow all lab and equipment safety rules. **Utah state law requires that safety glasses must be worn in the lab area at all times.** Anyone refusing to wear safety glasses will be asked to leave.
2. Follow written service procedures to prevent tool & component damage, or personal injury. A failure to do so resulting in tool or engine damage may result in point reduction from your “shop rules” grade.
3. No smoking or **spitting** in the building. (This also means into any cup or bottle.) This includes tobacco, sunflower seeds, etc. Anyone refusing to comply with this policy will be asked to leave.
4. The use of foul or offensive language will not be tolerated.
5. **Do Not** clock in or out for anyone else. Both the “clocker” and the “clockee” can lose a letter grade.
6. Cell phones and texting are major distractions so please do not let this interfere with your training.
7. Any of the following will be referred to the UVU Police Department:
   1. Theft or destruction of UVU or student tools, books, property or equipment.
   2. Any use of non-prescription drugs, alcohol, or stimulants.
   3. Fighting, harassment in any form, or disrespect of others.
   4. Improper use of UVU or personal computers or phones to view pornography in any form.
8. Reckless disregard of safety rules, abuse of equipment, or tools will be grounds for dismissal.
9. **No radios or ear buds** are allowed in the shop. You need you to be aware of your surroundings.
10. Keep the shop clean daily. Empty trash on Thursday’s (See the attached Lab Clean-up Check Sheet)

## Outcome Assessment

As the requirements from the task list are completed and scored, you will be demonstrating your level of competency or proficiency. The tasks in this class have been set up at an approximate 4:1 time ratio as compared to industry standards. This means that if you do not waste time and attend class every day, you should have sufficient time to **COMPLETE** all of the tasks on the list. Becoming **PROFICIENT** at a task is another story. This may require additional time after class.

There are only 28 days in this class so each day is important. Although not possible in every case, **you are strongly encouraged to repeat difficult tasks multiple times** to become proficient and prepare for the **TIMED** lab final. Simply completing a task to “sign it off” is meaningless if you cannot duplicate your performance **on your own** on the lab final. Ultimately, your future employer will require you to perform many of these same tasks efficiently, by yourself, without error, and often times with a customer watching or under duress. **DO NOT WAIT UNTIL THE END OF THE BLOCK TO COMPLETE YOUR TASK LIST THEN TRY TO CRAM IT IN THE LAST WEEK.** This is a recipe for disaster on the final. Procrastination and missing class is the number 1 reason students fail this class.

## Safety

State law requires everyone in the lab to wear safety glasses. In this class, your safety & shop rules grade represent 3% of your total lab grade. You start with 100 points and each time that you are caught without your safety glasses **over your eyes** in the lab, working unsafely, or leaving a mess, you will lose a minimum of 5 points from your safety & rules grade. Unsafe work behavior such as grinding without eye protection, failure to correctly block a vehicle, leaving an oil slick on the floor, or **failing to follow correct written service procedures leading to damaged tools, parts, or injury may result in larger point reductions.** You are responsible for your own safety as well as the safety of others in your work area. Rule infractions such as use of a radio or ear buds, service manual abuse, locking school tools or manuals in your tool box, tobacco violations, disrespect, or foul language may result in point deductions.

**Grading Breakdown**

Attendance = 15%, Tardiness = 7%, Safety & Shop Rules = 3%, Task List = 35%,

Lab Final = 40%

## Grading Scale for Attendance

|  |  |
| --- | --- |
| 0 Days = 100% | 6 Days = 50% |
| 1 Day = 95% | 7 Days = 40% |
| 2 Days = 90% | 8 Days = 30% |
| 3 Days = 80% | 9 Days = 20% |
| 4 Days = 70% | 10 Days = 0% |
| 5 Days = 60% |  |

## Grading Scale for Tardiness

|  |  |
| --- | --- |
| 0 to 2 Days = 100% | 7 Days = 50% |
| 3 Day = 90% | 8 Days = 40% |
| 4 Days = 80% | 9 Days = 20% |
| 5 Days = 70% | 10 Days = 0% |
| 6 Days = 60% |  |

**Topical Courses Outline**

**Week1** Cooling system component identification, familiarization & presentations.

**Week’s 2-3** Engine reassembly tasks and engine tune-ups.

**Week’s 4-5** Engine component tasks and engine tune-ups

**Week’s 6-7** Intake, exhaust, & fuel transfer system presentations and lab final.

## Keys to Success

* 1. Attend class every day and be on time.
  2. Ask questions for clarification or assistance when needed.
  3. Complete **ALL** of the assignments on your task list. Your lab final is timed and comes directly from your task list. If you are unsure about any task, you need to **practice until you can do it by yourself.**
  4. **Learn to work independently.**
  5. **Do not waste time.** There are only 28 days in the block so there is not time to procrastinate.
  6. Do not just dive in and tear stuff apart. Learning to find information **on your own** is the most important part of training. **If you simply go and ask someone, you are cheating yourself & you will fail the lab final.**
  7. Do not be too eager to trust another student's advice. **More often than not, it is bogus!**
  8. **Learn how to think.** If you do not know how something works, it is impossible to tell if it’s not working correctly, or how it affects other systems on a machine.
  9. Never use more than a **REASONABLE EFFORT.** How tight is too tight? If it doesn’t move what next?
  10. Use afternoons or Fridays to catch up if you get behind, repeat any tasks you may not yet be proficient with, or perform any task that was done during a show and tell by yourself.
  11. Learn to transfer relevant information or skills from theory to lab, class to class, machine to machine, etc.

1. **NOTE:** **This syllabus is a general guideline for this course and not a contract.** Although it is not very common, I reserve the right to make changes to anything including grading **at any time** throughout the duration of this class. Please keep your personal information current in UV Link so I can easily contact you should I make any changes to this course.

## Daily Lab Clean-up Check Sheet

**Every day before you leave you should look over this list as you are cleaning up. Remember that you are responsible for the whole shop and not just for the area in which you worked. Failure to participate in daily lab clean up can result in loss of points from your safety/clean-up grade.**

1. Benches cleared and wiped off

2. Bottles, Cans, & Trash thrown away

3. Oil spills and slick spots wiped up

4. Dirty rags thrown away

5. Work area wiped up and floor swept

6. Brooms & Squeegees put away

7. Air & Water hoses put up

8. Tool room tools checked back in

9. Toolboxes parked **NEATLY** in the shop

10. Wood blocking put away

11. Service Manuals put back in their correct location

12. Extra Bolts & Fittings returned

13. Sprays & Lubricants returned

14. Waste oil containers emptied, cleaned & returned

15. Trash cans emptied on Thursdays or when full