

Course Syllabus

DEMR 1323 (3:1:6)

HVAC Troubleshooting and Repair

Diesel Service Technology

Industrial Technology

Technical Education Division

South Plains College

Levelland, Texas

Fall 2021

Course Title: HVAC Troubleshooting and Repair

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Office Hours: Will be published on 12<sup>th</sup> class day

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**General Course Information**

Course Description

This course is an introduction to heating, ventilation, and air conditioning theory, testing and repair. Emphasis is on refrigerant reclamation, safety procedures, specialized tools, and repair.

Course Outline

- Multispeed Blower Circuit Operations.
- Heat absorption principles.
- Air conditioning cycle components and operation.
- Case and Duct system
- Cooling system components and operation.
- Air conditioning system servicing and diagnosis.
- Flashing BCM.
- 609 Certification.

Course Learning Outcome

The student will analyze heating, ventilation, and air conditioning systems; utilize special tools; and repair or replace components.

SCANS and Foundation Skills

C1 through C20 and F1 through F17. A description of these SCANS skills is printed on the back of the syllabus cover sheet for reference.

Verification of Workplace Competencies

All graduating students in the diesel service technology program will have a comprehensive, exit review exam administered in order to comply with the state requirement for a capstone learning experience.

**Specific Course / Instructor Requirements**

Required Materials

- Cengage Unlimited-Access (24 Months) ISBN: 9780357700051- Available in the bookstore, you will only need one copy for all of your Diesel courses.
- Tools per provided list.
- Notebook (quality, you will be using it in the lab. One may be shared across all of your DST classes.)
- Writing utensils.
- Safety Glasses.
- Safety Toe Shoes.
- Pocket Knife (not a box cutter).

Recommended Materials

## Daily or Weekly Planner

### Syllabus Agreement

This syllabus is a contract with the student and is used in college courses to outline the expectations of the course, the student and the instructor. Please print, sign, and submit the Student Syllabus Agreement form, expressing that you have read, understand, and agree to the course rules and expectations outlined in the syllabus.

### Student Conduct

Student Conduct will follow the outlines of the Student Guide (<http://catalog.southplainscollege.edu/mime/media/view/53/1585/2020-21StudentGuide.pdf>) for anything not covered under the purview of this syllabi.

Failure to follow lab rules and course directives may result in being excused from class with an absence at the instructor's discretion.

### Academic Integrity

See current Student Guide for policy details. Cheating and/or plagiarism will result in a zero grade, and disciplinary action may be taken at the discretion of the instructor.

### Attendance

Students that attains more than two (2) absences are considered excessively absence, and there are no excused absences. An absence will be issued when a student attends less than three quarters (3/4) the scheduled time, for that particular day, leaves class without notifying the instructor. Students who have a grade average below 70 and excessive absences will be dropped, and may also be dropped from concurrent courses. A student is tardy if they are not present when roll is taken. Two (2) tardy circumstances are equal to one absence.

### **Sleeping in Class or Lab**

The inability to stay awake in class or lab is an indication that you are too tired to function safely in our environment, and you will be dismissed for safety reasons. This is considered an absence since you are not present.

### Bullying, Hazing & Other Misconduct

Bullying, hazing, or any other misconduct toward fellow students, the instructors or visitors to the program will not be tolerated. Disciplinary action will be taken per the standards set in the Student Handbook and may lead to expulsion. The instructor may choose to excuse you from class with absence.

### Work Missed if Absent

Students are responsible for all work covered during absences from class, even in cases in which they are able to satisfy the instructor that the absence was unavoidable. When an unavoidable reason for class absence arises, such as illness, an official trip authorized by the college or an official activity, the instructor may permit the student to make up work missed. In such case, it is the student's responsibility to complete work missed within a reasonable period of time as determined by the instructor. This is merely for work missed, and does not make any absence excused. This does not apply to classroom tests/quizzes or lab tests/quizzes.

### Late Assignments

Assignments turned in after the assigned due date will not be accepted and will result in a zero grade for that assignment. Reasonable circumstances for a late assignment may be accepted with a penalized grade with the instructor's permission.

### **Grading**

Exams will be given periodically throughout the semester at the instructor's discretion. Lab assignments will be given and completed at the assigned dates. At the end of the semester, a comprehensive final exam will be given. There are five categories taken into consideration when computing the final semester grades: Lab Assignments: 50%, Tests: 25%, Homework 20%, Attendance 5%.

- a) Lab Assignments 50%
  - i) The Lab Assignment section includes, but is not limited to, hands on assignments, lab tests lab task sheets and daily lab grades.
  - ii) Point deduction from lab:
    - (1) Late or not showing up for the end of semester clean-up will result in forfeit of all lab points.
    - (2) Leaving a lab project partially disassembled, leaving out parts, or not turning in complete work order results in a zero on that assignment.
    - (3) Damaging lab projects will result in a deducted grade for projects as follows:
      - (a) Damaged, but repaired correctly -5 points
      - (b) Damaged, required part replacement -10 points
      - (c) Damaged, not repairable -50 points
      - (d) Damaged, abandoned -100 points
    - (4) Absences will result in a zero lab grade for each day you are absent.
  - iii) **Note:** When you apply for a signature on an assignment, you will be randomly, verbally, quizzed on your knowledge of the project, procedures, etc. Inability to answer questions will result in an incomplete until you comply with the research assigned at that moment.
- b) Tests 25%
  - i) Midterm tests cover several sections of related materials. Absence on test days results in a zero grade.
- c) Homework: Quizzes, Book Assignments, Worksheets, etc. 20%
  - i) Daily reading assignments, workbook assignments and Blackboard quizzes are designed help you learn the material more efficiently and prepare you to participate in class. You are expected to show your work through the assignments under Homework.
- d) Attendance 5%
  - i) Showing up is a major factor in your success as a technician and your ability to get and keep a job. Showing up on time and staying the whole time will result in a 100 for the day. Late arrival, returning late from break or disappearing for significant amounts of class time will result in a Tardy, creating a 50 for the day. No show results in a 0 for the day. In the case of an emergency or illness, timely notification of the situation (I don't need details), and as applicable a doctor's note, can adjust those grades.
- e) Grade Levels: There are four levels of attainable grades in the diesel technology program. The levels are A - (90 and above); B - (80-89); C - (70-79); F - (69 and below). This grading policy follows industry standards used in certification testing.

#### Hazardous Materials

Students will come in contact with chemicals and other materials, which come under the "Hazardous Material" classification as defined by Title 83, Article 5182b of the Hazard Communication Act. Material Safety Data (MSD) information will be posted in the lab area. Safety information will be given and shown in class before the safety test. (Examples of materials: used engine oil, fuel, antifreeze, etc.)

#### Accommodations

##### Levelland Campus & Reese Campus

Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland (Student Health & Wellness Office) 806-716-2577, Reese Center (Building 8) 806-716-4675, or Plainview Center (Main Office) 806-716-4302 or 806-296-9611. Reese Center and the Lubbock Center. (Also see current college catalog.)

In this class, the teacher will establish and support an environment that values and nurtures individual and group difference and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and

about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

If you are pregnant or have given birth within six months, Under Title IX you have a right to reasonable accommodations to help continue your education. To activate accommodations you must submit a Title IX pregnancy accommodations request, along with specific medical documentation, to the Director of Health and Wellness. Once approved, a notification will be sent to the student and instructors. It is the student's responsibility to work with the instructor to arrange accommodations. Contact Chris Straface, Director of Health and Wellness at 806-7162362 or email [cstraface@southplainscollege.edu](mailto:cstraface@southplainscollege.edu) for assistance.

#### Campus Carry

Campus Concealed Carry - Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations, please refer to the SPC policy at:

([http://www.southplainscollege.edu/human\\_resources/policy\\_procedure/hhc.php](http://www.southplainscollege.edu/human_resources/policy_procedure/hhc.php)) Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses.

Report violations to the College Police Department at 806-716- 2396 or 9-1- 1

Please refer to Senate Bill 11 and South Plains College's campus carry policy if you choose to exercise your rights to carry on campus. Please keep in mind when choosing to carry the nature of the work in the lab and secure your weapon in a manner that will prevent it from interfering with your work.

#### COVID

If you are experiencing any of the following symptoms please do not attend class and either seek medical attention or get tested for COVID-19.

- Cough, shortness of breath, difficulty breathing
- Fever or chills
- Muscles or body aches
- Vomiting or diarrhea
- New loss of taste and smell

Please also notify DeEtte Edens, BSN, RN, Associate Director of Health & Wellness, at [dedens@southplainscollege.edu](mailto:dedens@southplainscollege.edu) or 806-716-2376.

<http://www.southplainscollege.edu/emergency/return-to-campus-plan.php>

## **DST Classroom and Lab Area Rules**

1. Always follow safety rules. They are for your protection.
2. Personal Protection Equipment: Safety glasses will be properly worn at all times. Acceptable lens colors: clear, yellow colored lenses. Mirrored or dark lenses will be permitted for outside work only. Sunglasses will not be allowed indoors or outdoors. All safety glasses must be “ANSI Z-87-1” or better certified. Safety toe footwear are required and will be worn at all times. Non-compliance will result in dismissal for the day with an absence.
3. Service bay doors will be either fully raised or lowered. Not left partially open.
4. No tobacco products are allowed in campus buildings, and smoking must not be done within 25 feet of the building, per campus policy. This policy includes vaping.
5. No shorts to be worn in the lab areas. Clothing should be well-fitting and appropriate for work. Clothing with obscene, profane or otherwise inappropriate language or images will not be allowed.
6. No student parking is allowed inside the south fenced-in area.
7. The DST program adheres to the South Plains College zero tolerance policy for controlled substances. Should an instructor suspect a student is under the influence of drugs or alcohol while on campus, they will remove the student from class and/or lab and the appropriate disciplinary measures will be enforced.
8. All electronic devices will be used only for course related work. Inappropriate and/or unrelated use of electronic devices, including cell phones, can result in your dismissal for the day with an absence.
9. You are required to have your own tools to be able to participate in class.
10. Do not store South Plains College tools, equipment or project parts in your toolbox. If you do put SPC property in your box, we can and will use any means necessary to open your box if you are not present. While your box is present in our facility, it is subject to search at any time at an instructor’s discretion. We are not responsible for any damage or losses that may occur due to this policy. You are welcome to register a spare key with your instructor for the semester to avoid such situations.
11. In accordance with Texas Commission on Environment Quality (TCEQ), there are to be no open or unlabeled containers in the lab or classroom areas. Only small quantities may be held in open containers, which must be labelled, and currently in use.
12. All SPC property, including equipment keys and tools, must be put away at class clean up. You are responsible for putting away all your personal tools, sorting equipment neatly and disposing of all trash daily.
13. When lifting/moving materials, equipment, etc with the forklift, gantry or engine lifts must be safely secured and use of a safety chain is required where applicable.
14. Maintain awareness of your surroundings and your peers in the lab.
15. Maintain a clean workspace, clean up spills, debris, etc. immediately, and clean up your workspace and tools daily.
16. Do not drive bearings with hard steel tools.
17. Do not spin bearings or turbochargers with compressed air.
18. Intentional destruction of school property will result in immediate dismissal from the program.

19. You will be around chemicals, electricity and moving equipment, exercise caution and self-awareness in your actions and daily assignments.

## Student Syllabus Agreement

I, \_\_\_\_\_ (Name), have read and understand the syllabus for DEMR 1323 HVAC Troubleshooting and Repair, the rules outlined there, as well as the attendance, academic integrity and grading policies. I agree to abide by and follow the rules and policies of the syllabus, as well as the South Plains College Student Handbook.

Date: \_\_\_\_\_

Signature: \_\_\_\_\_



## ***SCANS COMPETENCIES***

C-1 **TIME**--Selects goal--relevant activities, ranks them, allocates time, and prepares and follows schedules. C-2 **MONEY**--Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives C-3 **MATERIALS & FACILITIES**-Acquires, stores, allocates, and uses materials or space efficiently. C-4 **HUMAN RESOURCES**--Assesses skills and distributes work accordingly, evaluates performances and provides feedback.

### **INFORMATION--Acquires and Uses Information C-5**

Acquires and evaluates information.

C-6 Organizes and maintains information.

C-7 Interprets and communicates information.

C-8 Uses computers to Process information.

### **INTERPERSONAL--Works With Others**

C-9 Participates as members of a team and contributes to group effort.

C-10 Teaches others new skills.

C-11 Serves clients/customers--works to satisfy customer's expectations.

C-12 Exercises leadership--communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.

C-13 Negotiates-Works toward agreements involving exchanges of resources resolves divergent interests.

C-14 Works with Diversity-Works well with men and women from diverse backgrounds. **SYSTEMS--**

### **Understands Complex Interrelationships**

C-15 Understands Systems--Knows how social, organizational, and technological systems work and operates effectively with them

C-16 Monitors and Correct Performance-Distinguishes trends, predicts impacts on system operations, diagnoses systems' performance and corrects malfunctions.

C-17 Improves or Designs Systems-Suggests modifications to existing systems and develops new or alternative systems to improve performance.

### **TECHNOLOGY--Works with a variety of technologies**

C-18 Selects Technology--Chooses procedures, tools, or equipment including computers and related technologies.

C-19 Applies Technology to Task-Understands overall intent and proper procedures for setup and operation of equipment.

C-20 Maintains and Troubleshoots Equipment-Prevents, identifies, or solves problems with equipment, including computers and other technologies.

## ***FOUNDATION SKILLS***

### **BASIC SKILLS--Reads, writes, performs arithmetic and mathematical operations, listens and speaks F-1**

Reading--locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.

F-2 Writing--Communicates thoughts, ideas, information and messages in writing, and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.

F-3 Arithmetic--Performs basic computations; uses basic numerical concepts such as whole numbers, etc. F-4

Mathematics--Approaches practical problems by choosing appropriately from a variety of mathematical techniques.

F-5 Listening--Receives, attends to, interprets, and responds to verbal messages and other cues.

F-6 Speaking--Organizes ideas and communicates orally.

### **THINKING SKILLS--Thinks creatively, makes decisions, solves problems, visualizes, and knows how to learn and reason**

F-7 Creative Thinking--Generates new ideas.

F-8 Decision-Making--Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.

F-9 Problem Solving--Recognizes problems and devises and implements plan of action.

F-10 Seeing Things in the Mind's Eye--Organizes and processes symbols, pictures, graphs, objects, and other information.

F-11 Knowing How to Learn--Uses efficient learning techniques to acquire and apply new knowledge and skills. F-

12 Reasoning--Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

**PERSONAL QUALITIES--Displays responsibility, self-esteem, sociability, self-management, integrity and honesty**

F-13 Responsibility--Exerts a high level of effort and preservers towards goal attainment.

F-14 Self-Esteem--Believes in own self-worth and maintains a positive view of self.

F-15 Sociability--Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings.

F-16 Self-Management--Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.

F-17 Integrity/Honesty--Chooses ethical courses of action.