

COURSE SYLLABUS

DEMR 1323 (3:2:4)

Heating, Ventilation and Air Conditioning (HVAC) Troubleshooting and Repair

Diesel Service Technology

Industrial

Technical Education Division

Levelland

SOUTH PLAINS COLLEGE

FALL 2018

Campus Listed as Appropriate to Class:
Levelland

COURSE SYLLABUS

COURSE TITLE: HVAC Troubleshooting and Repair

INSTRUCTOR: Whitney Owens

OFFICE LOCATION

AND PHONE/E-MAIL: Office #104, Phone 716-2293, wowens@southplainscollege.edu

OFFICE HOURS: Published on 12th class day

SOUTH PLAINS COLLEGE IMPROVES EACH STUDENT'S LIFE

I. GENERAL COURSE INFORMATION:

- A. 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 repairs.
- B. Course Learning Outcomes: The student will analyze heating, ventilation, and air conditioning systems; utilize special tools; and repair or replace components.
- C. Course Competencies: This course uses established Associated Equipment Dealers (AED) and Automotive Service Excellence (ASE) competencies. Upon completion of this course the student must demonstrate the ability to:
 - 1. Properly utilize shop equipment pertaining to the servicing of heating and cooling systems as found on modern diesel equipment.
 - 2. Accurately follow industry service guidelines.
 - 3. Properly diagnose and correct air conditioning system malfunctions and system control complaints.
 - 4. Locate pertinent service information using computer based manuals.
- D. Academic Integrity: (see current college catalog for policy)
- E. SCANS and Foundation Skills: C1 through C20 and F1 through F17. A description of these SCANS skills is incorporated in this syllabus for reference.
- F. 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".

II. SPECIFIC COURSE/INSTRUCTOR REQUIREMENTS:

- A. 1) Fundamentals of Medium/Heavy Duty Commercial Vehicle Systems; Jones & Bartlett Learning – CDX Automotive ISBN 9781284041163
2) tools per DST tool list
- B. Attendance Policy: (see current college catalog). Additionally, training here is not only for operation of systems, components and repair techniques, but to prepare you for the working world. The potential employer looks at such traits as punctuality, responsibility and regularity. Therefore, regular and punctual attendance is required here just as would be required by an employer. Your first absence in class is to be considered a warning. Upon obtaining the 4th absence, you will be dropped from the course. Three tardies are considered equal to and count as 1 absence. Arriving after the first hour counts as an absence. If you arrive late and an exam, quiz, or other test has begun, you will not be allowed to take that exam, quiz or test and a grade of zero (0) will be recorded for it.
- C. Assignment Policy: Assignments will be given from time to time at the instructor's discretion. All assigned work will be due on the day, time and manner specified at the time the assignment is given. Late work is penalized.
- D. Grading Policy/Procedure and/or methods of evaluation:
1. CLASSROOM (30%): All classroom grades are combined (exams, pop tests and assignments) into one classroom category. Exams, pop tests and assignments will be given periodically throughout the semester at the instructor's discretion. A comprehensive midterm may be administered at approximately the 8 week point in the semester. This midterm exam, if given, will include written and may also include hands on lab practical elements as instructor deems necessary. The written portion of this midterm will be counted into the average 3 times. The lab portion (of the midterm) will count as a practical grade, also counting 3 times. Poor performance on the midterm will have adverse effects on the semester grade. A comprehensive (all information during the semester) final exam will be administered during finals week and will be counted into the average 3 times. EXEMPTION FROM FINAL: None. Do not expect a final exam to pull you up to a passing grade if you have done poorly for the semester.
 2. LAB GRADE (70%): Lab grades will be based in two ways. 1) Skills-based practical exams (25%) given throughout the semester and a general (daily) grade (45%) that is based on the way you conduct yourself as a professional-to-be in training. A base value of 90 is used for this daily grade. Additional points on the general shop grade portion can be earned for exceptional performance, outstanding attitude, etc., or they can be deducted for poor effort, not following directions, safety infractions, willful damage to training equipment, disappearing, lack of participation in group activities, etc., at the instructor's discretion. The daily grade can also reflect your participation, conduct and contribution in the classroom and lab environment.
 3. 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.

4. **TUTORING:** Students who do not pass their first exam will be required to attend three hours of tutoring each week until they pass their next exam. This is a course requirement and will be reflected in the course grade.
5. **MAJOR EXAMS:** Major exams (chapter, section, finals, etc.) are always scheduled well in advance. If you are late for the test, you will not be allowed to take the exam and a zero will be recorded.
6. **POP TESTS / QUIZZES:** These will be given throughout the semester at instructor's discretion. They are graded into the classroom category. Some will be graded and not recorded (as a check of your knowledge) or taken as a grade at instructor's discretion. Arriving to class after a pop test has begun will prevent you from taking the quiz or test and you will receive a zero for it. Generally, the lowest two pop quiz grades are dropped when calculating classroom average at the end of the semester. This also, is at instructor's discretion.

E. **SPECIAL REQUIREMENTS:**

1) Appropriate safety equipment to be worn and or used as necessary. This includes steel toe safety boots and safety glasses which are to be correctly worn at all times in lab spaces.

2) Lab sheets and/or job sheets are posted in the Blackboard system. All students enrolled in this class have access to Blackboard using their assigned username / password. Students are expected to have a printout of these lab sheets when coming to class/lab. If you do not have the lab sheets, you will not be permitted in the lab that day.

III. **COURSE OUTLINE**

- A. Introduction
 1. Heat and cold
 2. Temperature and pressure
 3. Evaporation and condensation
- B. Air conditioning systems
 1. Components and Their Functions
 2. Operation
 3. Refrigerants
- C. Heating / Ventilation
- D. Service equipment
 1. Gauges
 2. Reclaim / recycle units
 3. Vacuum pumps
 4. Leak detectors
- E. Diagnostics

IV. **HAZARDOUS MATERIALS:**

Students will come in contact with chemicals and other materials, which are classified as HAZARDOUS MATERIAL by EPA and/or TCEQ. Examples of these materials include

used engine oil, hydraulic fluid, antifreeze, batteries, various light bulbs and other items. Material Safety Data Sheets (MSDS) are located in the areas affected. Appropriate safety equipment is provided and is expected to be used.

V. REQUIRED STATEMENTS

Diversity Statement

In this class, the teacher will establish and support an environment that values and nurtures individual and group differences 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.

Disabilities Statement

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.

Non-Discrimination Statement

South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360.

VI. Continued Enrollment

It is the desire of the faculty of the Diesel Service Technology Program for you to succeed. To do so involves not only the instructor, but the student. As a student here, you will have the opportunity to acquire knowledge and skills that will equip you to become a successful technician.

Attendance in this program is by choice. With that in mind, we function on the premise that you want to succeed and want to acquire the skills needed to do so. It must be recognized that in order to do so, you, the student, will be required to put forth your share of effort in studies and practical labs.

Our program has grown in stature over the years largely in part due to the quality of our graduates. They are in demand. In order to maintain the quality and status of our program, we find it necessary to produce the best possible graduates

In trying to keep with our goal of high quality graduates, one-on-one instructor time is critical. We cannot put time and effort towards someone who is not trying to succeed. We cannot permit someone like that to remain, as it becomes a distraction to those of the class who are making the effort. With quality in mind, if you want to continue in our program, you must meet certain standards, or more appropriately stated, avoid the following which include but are not limited to:

- Not putting effort into the learning process
- Poor performance in classroom or lab
- Overtly displaying an “I don’t care” attitude
- Frequent tardiness, absences and leaving early (skipping)
- Being unprepared for class with no demonstrated efforts to improve
- Not being focused on lab work assignments
- Not being prepared for class
- Habitually not following directions
- Cheating, lying, taking credit for another students work

If it becomes obvious to your instructor that one or more of these conditions apply, it will be strongly recommended that you withdraw from the program. Failure to do so, can, at the instructor’s discretion, result in your being administratively dropped. If you find yourself in this situation, you may want to reconsider your career choice.

It is not our intent to allow anyone to fail. Success or failure is entirely up to you. We will do all we can to help you, but you have a part to contribute. Failure to make that contribution will result in failure.

If you have personal problems, or a lack of resources, we can arrange for you to speak with counselors or put you in contact with someone who may be able to assist you. However, if you don’t tell us about a problem, we can’t help you with it.

GENERAL RULES

1. Always follow safety rules. They are for your protection.
2. Attendance: The attendance policy is in the syllabus for the course(s) you are enrolled. Syllabi for the diesel courses are available anytime via the college website. It is highly advised that you read them as they contain your instructor’s policies and requirements. Each instructor may have differences on their requirements and grading. Instructor office hours are also in the syllabus.
3. Safety Equipment (PPE): Safety glasses will be properly worn at all times in the lab areas of our complex. You may have either the clear or the light yellow colored lenses. NO mirrored or otherwise colored lenses. All safety glasses MUST clearly display an “ANSI Z-87-1” or better labeling. As of fall 2014, steel toe boots (or composite) are required and will be worn in the lab

area. Penalties for violations of these policies are being dismissed from class for the day with an absence.

4. Service bay doors will be either fully raised or lowered.
5. No smoking, eating, drinking or chewing in the classroom, lab areas or any building on campus.
6. Clothing: Caps only are permitted in the lab area. No shorts to be worn in the lab areas. Loose fitting, floppy and baggy clothing is deemed a safety hazard. No obscene, profane or otherwise inappropriate language (as determined by instructors) or similar items will not be tolerated. Long hair and dangly jewelry should be confined for safety reasons.
7. An instructor will pick up any books, clothes, tools or other personal items that are found lying about at the end of the day. Paying a fine of \$1.00, which is deposited into the Scholarship Fund, may claim the item(s).
8. No parking is allowed inside the south fenced in area. Park in designated parking area only.
9. If you arrive for class "hung over", drunk, under the influence of drugs (prescribed or not), or an instructor believes that you are, you will be either confined to the classroom and/or the campus police will be notified. We deem it as a severe safety hazard.
10. If you are caught sleeping in class or lab, you will be dismissed from class for the day with an absence.
11. Foreman/Inspector: This duty is required of all students on a rotation basis. A schedule will be posted by your instructor as soon as final enrollment is determined. Duties include, but are not limited to: supervising cleanup in a designated area, overseeing equipment storage at end of day, and other items as determined by your instructor.
12. Electronic Devices: No student cell phones are permitted in the classroom or lab area. They are a distraction to your learning, to other students and the class as a whole. You are subject to an absence and being sent home for the day for violation of this policy. For emergency, people may call 806-716-2293 or campus police at 806-891-8883. No music playing devices are permitted. A laptop or tablet device may be used in the classroom or lab area ONLY AS LONG AS that use is directly connected to the current classroom or lab activity that is being conducted.
13. You are to have your required set of personal tools by the 5th class day. Your tools must be present at all times in order to be eligible to participate in class. Talk to your instructor if this is a problem.
14. Any item that comes into question and is not covered in these rules or in the course syllabi will be dealt with on an individual basis. See your instructor.
15. It is your responsibility to know and understand these rules. If there are items which you do not understand, ask your instructor.

16. Do not store South Plains College owned tools, equipment or project parts in your toolbox. We can and will use any means necessary to open the box to retrieve the items if you are not present. While your box is present in our facility, it is subject to search at any time as deemed necessary by an instructor. If we have to open a box, we DO NOT relock it. We are not responsible for any damage or losses that may occur due to this policy.

17. All spills are to be cleaned up immediately.

18. No student vehicles are permitted to be in the lab area at any time for any reason.

19. Open Containers: In accordance with Texas Commission on Environment Quality (TCEQ), there are to be NO open and unlabeled containers in the lab or classroom area. This does NOT include cans used to sort and store hard parts such as bolts, nuts, fittings, etc. Only small quantities may be held in open containers, but they MUST be labeled and they MUST be in use at the time.

20. Batteries: If you utilize a battery from our supply rack during a lab activity, the battery will be returned to the rack and reconnected to the charge system at the end of the day. NO EXCEPTIONS.

21. Equipment Keys: The keys for the heavy equipment will be located centrally and must be signed out. The person signing out the key is held responsible for loss or misplacement. All keys will be returned at the end of the class day.

22. Tool Crib: No students are permitted in the tool crib unless accompanied by their instructor. All tools are signed out. The person who signs them out is held responsible for loss or misplacement. All tools to be returned at end of class day. There will be no holdouts overnight unless there are special circumstances such as complicated tool setup. Those instances must be approved by your instructor.

(Rules revised 1/9/18)

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.