

COURSE SYLLABUS

DEMR 2335 (3:2:4)

ADVANCED HYDRAULICS

Diesel Service Technology

Industrial

Technical Education Division

Levelland

SOUTH PLAINS COLLEGE

Spring 2019

Campus Listed as Appropriate to Class:  
Levelland

## COURSE SYLLABUS

COURSE TITLE: Advanced Hydraulics

INSTRUCTOR: Tony Ortiz

OFFICE LOCATION  
AND PHONE/E-MAIL: Office #126, Phone ext. 2294, tortiz@southplainscollege.edu

OFFICE HOURS: Published on 12<sup>th</sup> class day

### SOUTH PLAINS COLLEGE IMPROVES EACH STUDENT'S LIFE

\*\*\*\*\*

#### I. GENERAL COURSE INFORMATION:

- A. Course Description: This course provides advanced study of hydraulic systems and components including diagnostics and testing of hydraulic systems.
- B. Course Learning Outcomes: Identify various hydraulic systems; evaluate performance, testing and troubleshooting.
- C. This course uses established Associated Equipment Dealers (AED) competencies. Upon completion of this course the student must demonstrate the ability to:
  - 1. Function and use of types of hydraulic valves; pressure, control and volume
  - 2. Electro-hydraulics valves and control systems
  - 3. Demonstrate use of schematics
  - 4. Follow fluid flow using schematics
  - 5. Perform basic diagnostic tests and interpret results.
- D. Academic Integrity: (see current catalog)
- E. 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.
- 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:

Textbook and Other Materials: *Fundamentals of Mobile Heavy Equipment*, by Owen C. Duffy, Scott A. Heard and Gus Wright, Published by Jones & Bartlett Learning ISBN 9781284112917; tools per provided list

B. Attendance Policy: (see current college catalog for policy) also: A student that attains 3 absences, from a combination of all classes, will be administratively dropped from all classes. There are no excused absences. An absence will be issued when a student attends less than one half (1/2) the scheduled time, for that particular day. Three (3) tardy circumstances are equal to one absence. A tardy circumstance will also occur for the following:

1. Not staying on task 1 tardy
  - a. Continued lack of interest /results on lab projects 3 X tardy
2. Improper use of lab computers (during lab time) 1 tardy
  - a. Checking email
  - b. Playing games
  - c. Looking at a site not associated with the lab project
  - d. Moving computer from assigned location and orientation
3. Not using safety glasses in the lab 2 X tardy
  - a. Safety glasses not properly covering the eyes
  - b. Not an ANSI approved set
4. Unsafe lab area conditions 2X tardy
  - a. Not operating equipment or handling components safely
  - b. Not maintaining your lab area clean of spills or tripping hazards
5. Disrupting class 2 X tardy
  - a. Horse-playing
  - b. Allowing other students to disrupt your lab time
  - c. Using cell phone during class or lab
  - d. Using ear buds/head phones during class
  - e. Any disruptive behavior

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.

- C. Assignment Policy: Assignments will be given from time to time at the instructor's discretion. All assigned work will be due at the beginning of the class for which the assignment is given, and on the day specified at the time the assignment is given.
- D. Grading Policy/Procedure and/or methods of evaluation: Exams will be given periodically throughout the semester at the instructor's discretion. At the end of the semester, a comprehensive final exam will be given. There are three categories taken into consideration when computing the final semester grades.

1. Classroom grades: This will include tests, quizzes, assignments, homework and classroom participation.
  - a. 7% from quizzes and assignments
  - b. 13% from major tests
  - c. 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.

The grades earned during the semester will be averaged and this average will count as 20% of the final semester grade.

2. Lab grades: Each student will receive a daily grade based on attitude, cooperation, and productivity and to what extent the student applies classroom theory to lab assignments. The grades earned during the semester will be averaged and this average will count as 60% of the final semester grade.

- a. Lab 60%
  - 1) All task sheets must be completed before one week before finals.
  - 2) Bench Marks
    - a) Reading schematics 30%
      - i. Instructor will advise student of action to be taken
    - b) Troubleshoot 30%
    - c) It will contain an unlimited number of possible faults/bugs (problems) with the project.

- b. Deduction from lab projects **per infraction**
  - 1) **Late or not showing up for end of semester cleanup will result in all project/projects deductions** **100%**
  - 2) Not following specified test procedure 20%
  - 3) Missing bolts per infraction 10%
  - 4) Brackets missing or not fastened 10%

- |  |      |
|--|------|
| 5) Improperly filling out work order         | 5%   |
| 6) Not using proper test ports for pressures | 30 % |
3. Final exam: At the end of the semester, a final exam will be given and the grade earned will count as 20% of the final semester grade.
- a. Final test will be comprehensive.

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.

- E. Special Requirements: Appropriate safety equipment to be worn and or used as necessary.
- F. 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 Sheet (MSDS) information will be posted in the file rack outside of the coordinators office. Warning signs are posted throughout the Auto-Diesel building and all appropriate personal protective equipment will be provided, which the student must use. Safety information will be given and shown in class before the safety test. (Examples of materials: used engine oil, fuel, antifreeze, etc.)

### III. COURSE OUTLINE

- A. Open center and Closed Center Hydraulic systems
- B. Variable Displacement Pump Controls
- C. Load Sensing
- D. Pressure and Flow Compensated Hydraulic Systems
- E. Hydraulic Pilot Controls
- F. Purpose and Fundamentals of Electronically Managed Hydraulic Systems
- G. Principles of Operating Electronically Managed Hydraulic Systems
- H. Excavator Hydraulic Systems
- I. Construction Features of Electronically Managed Hydraulic Systems
- J. Inspect, Test, and Diagnose an Electronically Managed Hydraulic System

#### IV. ACCOMMODATIONS

##### A. **Disabilities:**

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.

##### B. **Diversity:**

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.

(Also see current college catalog)

##### C. **Non-Discrimination:**

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.

##### D. **Pregnancy Accommodations:**

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, notification will be sent to the student and instructors. It is the student's responsibility to work with the instructor to arrange accommodations. Contact Crystal Gilster, Director of Health and Wellness at 806-716-2362 or email [cgilster@southplainscollege.edu](mailto:cgilster@southplainscollege.edu) for assistance.

##### E. **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 and Frequently Asked Questions, please refer to the Campus Carry page at: <https://www.southplainscollege.edu/campuscarry.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.

## **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 the Auto-Diesel 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 (or composite) boots are required and will be worn in the lab area of the Auto-Diesel complex. Not properly wearing the required PPE will be dealt with by an absence and being sent home for the day. This policy may be enforced by any instructor to any student in the Diesel Technology program.
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. Cell Phones / Electronic Devices: Unauthorized use of cell phones in the Auto-Diesel complex will be dealt with by an absence and being sent home for the day. They are a distraction to your learning, to other students and the class as a whole. For emergency, people may call 806-716-2293 or campus police at 806-891-8883. No music playing devices are permitted at any time. 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. This policy may be enforced by any instructor to any student in the Diesel Technology program.

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), NO open and unlabeled containers are permitted 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 to whom the tool is signed out to is held responsible for loss or misplacement. All tools are 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.

(Revised 1/8/19)

### **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.