# Course Syllabus

DEMR 1316 (3:2:4)

Basic Hydraulics

Diesel Service Technology

Industrial Technology

Technical Education Division

South Plains College

Levelland, Texas

Fall 2026

Course Title: Basic Hydraulics

Instructor: Marie Flores

Office: 204 Auto-Diesel

Phone: 806.716.2188

Email: emflores@southplainscollege.edu

Office Hours: Monday-Thursday 8am-3:30pm

Friday 8am-Noon

South Plains College Improves Each Student's Life

**********

## 1) General Course Information

a) Course Description: This introductory course covers the fundamentals of hydraulic systems used in diesel-powered equipment and mobile machinery. Students will study hydraulic theory, fluid properties, pressure and flow, hydraulic circuits, system components, symbols, and applications. Emphasis is placed on identifying hydraulic components, understanding their function and operation, reading hydraulic schematics, constructing basic circuits, and applying safe diagnostic procedures. Students will develop hands-on skills in inspecting, testing, evaluating, servicing, and troubleshooting hydraulic components and systems using industry-standard tools and test equipment.

b) Course Outline

Safety and Hydraulic Fundamental
Hydraulic Fluids and Contamination Control
Hydraulic Pumps
Hydraulic Valves
Actuators and Motors
Accumulators and Components
Schematics and Circuit Theory
System Testing and Diagnostics
Component Inspection and Evaluation
Circuit Troubleshooting
Hands-On Applications
Comprehensive System Evaluation

c) Course Learning Outcomes:

1. Explain hydraulic principles, theory, circuits, and applications including pressure, flow, force, fluid power, and the transfer of mechanical energy through hydraulic systems.
2. Identify various components used in hydraulic systems including pumps, valves, cylinders, motors, accumulators, reservoirs, filters, hoses, fittings, and related components.
3. Explain the function and operation of hydraulic components and describe how individual components work together within a hydraulic circuit.
4. Interpret hydraulic symbols and schematics and trace the direction of hydraulic flow through basic circuits.
5. Construct and test basic hydraulic circuits using hydraulic schematics, appropriate components, tools, and test equipment.
6. Evaluate hydraulic components by inspection and testing to determine condition, serviceability, wear, damage, and potential causes of failure.
7. Perform basic hydraulic system diagnostic tests including pressure, flow, temperature, and leakage testing while following safe operating procedures.
8. Analyze hydraulic system symptoms and test results to identify likely causes of system performance problems.
9. Apply systematic troubleshooting procedures to hydraulic systems used in diesel-powered equipment and related mobile machinery.
10. Demonstrate proper hydraulic service practices including contamination control, component handling, inspection, disassembly, reassembly, and post-repair verification.

d) 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:
Correctly use electrical test equipment and interpret its indications.
Trace circuits on equipment and diagrams.
Effect repairs to system components using industry standards.
Follow specific safety procedures relating to electrical system servicing.

e) **Academic Integrity:** (see current college catalog for policy). Cheating or plagiarism will result in immediate disciplinary action per the college's policy.

f) 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.

g) 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.

2) **Specific Course / Instructor Requirements**:

h) Laptop/Notebook/iPad (Blackboard Access Materials)
**Required Materials The Required Materials are required to perform the coursework; therefore, students who do not have the required items, specifically safety glasses, safety toe shoes and tools listed on the required tool list will be dropped. Failure to provide these required materials by the second class day and maintain them through the entire semester will result in an administrative drop from the course.**

3) **Attendance Policy:** (also see current college catalog). Additionally: A student that attains 3 absences will be administratively dropped from all classes. 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: i) Not staying on task 1 tardy ii) Improper use of electronic devices: 1 tardy iii) Not using safety glasses in the lab or safety glasses not properly covering the eyes: Absence iv) Unsafe lab area conditions 2X tardy v) Not operating equipment or handling components safely vi) Not maintaining your lab area clean of spills or tripping hazarders vii)

Disrupting class 2 X tardy:
(1)Horse-playing
(2)Profanity
(3)Allowing other students to disrupt your lab time
(4)Using ear buds/head phones during class
(5)Any disruptive behavior viii) Sleeping in Class or Lab: 1 Absence

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.

i) 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.

4) **Assignment Policy:** 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. If you are late for an exam you will not be allowed to take the exam. You will receive a zero for the exam.

j) **Grading Policy/Procedure and/or methods of evaluation:** 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 three categories taken into consideration when computing the final semester grades.

1. Classroom grades: These grades will consist of 60% Lab, Exams 20%, Quizzes & Homework 15%, Attendance 5%
2. 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.
3. Lab grades: These grades will constituent 60% of the final semester grade. Lab projects and task sheets will be completed by the assigned date. Each student must complete the assigned lab projects for the semester. In addition, there will also be lab benchmark tests throughout the semester.

k) **Point deduction from lab projects:**

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:
4. Damaged, but repaired correctly -5%
5. Damaged, required part replacement -10% vi) Damaged, not repairable -20% vii) Damaged, abandoned -100%

**Note**: When you apply for a signature on a project, 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.

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.

**Syllabus Statements can be found here:**
https://www.southplainscollege.edu/syllabusstatements/

**Student Conduct will follow the outlines of the Student Guide**
https://www.southplainscollege.edu/referral/

**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. No electronic devices, including cell phones, smart watches, or laptops 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/do not spin bearings or turbochargers with compressed air.

17. Intentional destruction of school property will result in immediate dismissal from the program.

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

19. **No music during lectures and lab, this rule applies to all forms of music or using audio devices during lectures and laboratory sessions. Including personal headphones/earbuds, speakers, and any audio output that may disrupt the learning experience of others.**

**DST Syllabus Agreement and Professional Expectations**

Thank you for your cooperation in creating a safe, professional, respectful, and effective learning environment.

This Syllabus Agreement and DST Rules document outlines the expectations and responsibilities of students enrolled in the Diesel Service Technology program. Students are responsible for reading and understanding the syllabus, following all classroom and laboratory rules, and meeting the academic, safety, attendance, and professional standards established for this course.

**If a student does not read, sign, and submit the Student Syllabus Agreement by the assigned due date, the student may be administratively dropped from the course.**

By signing the Student Syllabus Agreement, the student acknowledges that they have read, understand, and agree to follow the expectations outlined in this syllabus and the DST Rules.

Students are expected to:

- Follow all classroom, laboratory, safety, and equipment procedures.
- Wear and properly use all required personal protective equipment (PPE).
- Treat instructors, classmates, college personnel, industry partners, and visitors with professionalism and respect.
- Arrive prepared, on time, and ready to participate in classroom and laboratory activities.
- Take responsibility for their tools, equipment, assignments, work area, and learning.
- Demonstrate honesty, accountability, and integrity in all academic and laboratory work.
- Communicate professionally and work effectively as part of a team.
- Accept instruction, correction, and constructive feedback as part of becoming a better technician.
- Maintain a clean, organized, and safe work area.
- Follow proper procedures rather than taking shortcuts that could result in equipment damage, personal injury, or an improperly completed repair.
- Demonstrate the same level of professionalism expected in an actual diesel repair facility.

**Diversity, Inclusion, and Professional Respect**

The Diesel Service Technology program is committed to providing a learning and shop environment where every student is treated with professionalism, dignity, and respect. Students enter this program with different backgrounds, experiences, skill levels, perspectives, and learning styles. These differences can strengthen our learning environment and help prepare students for the diverse workplaces they will encounter throughout the diesel and transportation industries.

Students are expected to work professionally with people who may have different experiences, opinions, abilities, and approaches to learning. Differences of opinion should be handled respectfully and professionally. Students are expected to communicate appropriately, work cooperatively, and contribute to a positive and safe learning environment.

Harassment, discrimination, bullying, intimidation, disrespectful conduct, or behavior that interferes with another student's ability to learn or work safely will not be tolerated.

In the diesel industry, technicians must be able to work as part of a team. A technician may work with coworkers, supervisors, service advisors, customers, manufacturers, fleet personnel, and other industry professionals. **Professionalism is not optional—it is part of being a successful technician.**

Our goal is to prepare students not only to diagnose, repair, and maintain diesel equipment, but also to become dependable professionals who are prepared for the expectations of the workplace.

## The DST Standard

**Safety. Teamwork. Accountability. Professionalism. Respect.**

A successful diesel shop is built on technicians who show up prepared, work safely, take pride in their work, accept responsibility for their mistakes, learn from correction, help their teammates, and do the job correctly—not simply quickly.

**The standard in this program is not perfection. The standard is continuous improvement, professional conduct, safe work practices, and a commitment to becoming a better technician every day.**

**Student Acknowledgment**

I acknowledge that I have received, read, and understand the **Syllabus, DST Classroom and Lab Area Rules** listed above. I understand that these rules are established to maintain a safe, professional, and effective learning environment for all students, faculty, staff, and visitors.

I understand that I am responsible for following all classroom, laboratory, safety, equipment, personal conduct, and campus policies. I understand that failure to comply with these rules may result in removal from class or lab, an absence, disciplinary action, or dismissal from the program, depending on the violation.

By signing below, I acknowledge that I have had the opportunity to ask questions regarding these rules and agree to follow them throughout my enrollment in the Diesel Service Technology (DST) program.

**Student Name (Print):** _____

**Student Signature:** _____

**Date:** _____

Student Agreement

**I understand that safety is my responsibility, and I agree to conduct myself in a safe, respectful, and professional manner while participating in the DST classroom and laboratory.**

**Student Initials:** _____

**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