

# Heavy Duty Equipment Technology

**Course Title:** Diesel Engine Fundamentals 30S

**Instructor:** Mr. Church

**Contact Information:**

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## Prerequisites:

- Interest in mechanics
  - Exploration and Introduction to HD Equipment Technology
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## Course Description:

Students learn the basic principles of diesel engines, the inner workings and relations of the engine components, and how those relate to vehicle operation. They also learn the procedures to service, repair, and replace engines and their components

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## Shop Rules and Policies:

- **Safety Glasses & CSA Approved Footwear:** Safety glasses and CSA-approved footwear must be worn at all times in the shop.
  - **Parts Pickup:** Students are not permitted to drive to town for parts during class. Customers provide parts for projects.
  - **Safe Work Practices:** Students must follow the safe work practices outlined in the school and division policies. Failure to do so could result in removal from the course or program.
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## General Objectives & Learning Outcomes:

1. **Safety Practices:**
  - Understand and apply safety practices for heavy-duty equipment technicians.
2. **Tool and Equipment Use:**
  - Identify, select, use, and maintain tools, equipment, materials, and consumables.
3. **Diesel Engine Knowledge:**

- Understand and describe the components and functions of diesel engines, including engine systems such as fuel, intake, and exhaust.
  - 4. **Diagnostic Skills:**
    - Diagnose and repair diesel engine problems in heavy-duty equipment systems.
  - 5. **Cross-Curricular Knowledge:**
    - Demonstrate transferable skills and knowledge relating to heavy-duty equipment technology.
  - 6. **Sustainability Awareness:**
    - Understand the impact of sustainability on heavy-duty equipment technology.
  - 7. **Ethical & Legal Standards:**
    - Awareness of ethical and legal standards within the heavy-duty equipment service and repair industry.
  - 8. **Employability Skills:**
    - Develop skills necessary for employment in the heavy-duty equipment industry.
  - 9. **Technological Awareness:**
    - Demonstrate an understanding of the evolution of heavy-duty equipment technology, including emerging trends.
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## **Units of Study:**

- Engine cooling systems
  - Lubrication types and systems
  - Air intake, filtration, turbos, and super charging
  - Measuring devices, how to use and read them
  - Starting and cranking systems
  - Engine block design
  - Crankshaft design and components
  - Piston and connecting rod assemblies
  - Engine head and valve components
  - Disassemble and reassemble procedures
  - Setting and adjusting procedures
  - Environmental systems and its effects
  - Maintenance procedures
  - Future engine designs and expectations
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## **Evaluation:**

- **Assignments:** All assignments must be handed in on time. Late assignments will be marked as "0 and missing." All assignments must be completed to pass the course.
- **Late Assignments:** Late submissions may incur a 20% deduction or may require a quiz to verify the student's understanding of the material.

- **Additional Assignments:** Occasionally, supplementary assignments may be given to reinforce specific learning outcomes.
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## **Learning Behaviors:**

Students will be evaluated on the following learning behaviors based on in-class and shop activities. These behaviors will be marked in the PowerSchool program as follows:

1. **Personal Management Skills**
2. **Active Participation in Learning**
3. **Social Responsibility**

## **Marking Criteria:**

- **C** = Constantly demonstrates the behavior
- **U** = Usually demonstrates the behavior
- **S** = Sometimes demonstrates the behavior
- **R** = Rarely demonstrates the behavior

These marks will help assess how effectively students are managing their work and interactions in the class and shop settings.

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## **Assessment Guidelines:**

**Formative Assessments** will occur during the correction and class discussion of booklets.

- Quizzes will be graded by the instructor, and the answers will be discussed with the class.

**Summative Assessments** will take place at the end of the semester during the final exams.

## **Final Grade Weights:**

- **Projects:** 50%
  - **Quiz:** 20%
  - **Classwork:** 15%
  - **Demonstration:** 15%
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## **Class Expectations:**

1. **Safety First**
    - Students must adhere to all safety rules and procedures at all times.
    - Proper Personal Protective Equipment (PPE) must be worn in the shop.
  2. **Punctuality and Attendance**
    - Arrive on time for class and be prepared to participate.
    - If absent, it is your responsibility to catch up on missed work. Late assignments may be penalized.
  3. **Respect and Communication**
    - Treat all individuals with respect.
    - Use appropriate language; foul language and inappropriate conversations are not allowed.
    - Bullying or harassment will not be tolerated.
  4. **Work Area Maintenance**
    - Keep the work area clean and organized to ensure a safe environment.
    - Report any broken or damaged tools immediately. Do not leave parts on toolboxes or in any exit routes.
    - After use, return tools, consumables, and equipment to their designated places.
    - Help others clean up when needed.
  5. **Class Participation**
    - Engage actively in all shop activities and class discussions.
    - Use class and shop time efficiently to complete assignments and work.
  6. **Personal Responsibility**
    - Do not leave drink containers after use.
    - Stay organized and manage your materials effectively.
  7. **Classroom Etiquette**
    - Maintain a clean and respectful environment in both the shop and classroom.
    - Help maintain cleanliness by cleaning up after yourself.
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## **Heavy Duty Mechanics Program - Cell Phone Policy:**

1. **Instructor Permission Required** – Phones may only be used with instructor approval.
2. **Prohibited Uses** – No gaming or social media at any time.
3. **Shop Use** – Photos of projects are allowed only with instructor permission.
4. **Safety First** – No phone use while operating machinery or handling tools.
5. **Violations & Consequences**
  - **1st Offense:** Verbal warning.
  - **2nd Offense:** Phone confiscated for class.
  - **3rd Offense:** Phone turned in at the start of each class.
  - **Further Violations:** Additional discipline as per school policy.

