## Course Information

<table>
<thead>
<tr>
<th>Division</th>
<th>Industrial Technology Education</th>
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<tbody>
<tr>
<td>Course Number</td>
<td>DSL 130</td>
</tr>
<tr>
<td>Title</td>
<td>Diesel Electrical Systems Design and Diagnosis</td>
</tr>
<tr>
<td>Credits</td>
<td>3</td>
</tr>
<tr>
<td>Developed by</td>
<td>Steve Herbert</td>
</tr>
<tr>
<td>Lecture/Lab Ratio</td>
<td>2 Lecture/3 Lab</td>
</tr>
<tr>
<td>Transfer Status</td>
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<tr>
<td>Activity Course</td>
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<tr>
<td>CIP Code</td>
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<tr>
<td>Assessment Mode</td>
<td>Pre/Post Test (10 Questions/10 Points)</td>
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<td>Semester Taught</td>
<td>Fall</td>
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<td>GE Category</td>
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<td>Separate Lab</td>
<td>No</td>
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<tr>
<td>Awareness Course</td>
<td>No</td>
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<tr>
<td>Intensive Writing Course</td>
<td>No</td>
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### Prerequisites

None

### Educational Value

This course is designed to reinforce and apply information, processes, and ideas gained in other courses. The major intent of this course is to enhance the individual's abilities to work with and diagnosis the diesel electrical systems.

### Description

Course provides a study of diesel starting, charging, and accessory electrical systems and components. Course places emphasis on electrical system diagnosis and electrical repair. Course allows students to use various industry standard diagnostic electrical equipment and testing techniques. Prepares the student to take the ASE certification test on electrical/electronic systems.
**Competencies and Performance Standards**

1. **Apply proper safety procedures and processes.**

   **Learning objectives**
   
   *What you will learn as you master the competency:*
   
   a. Acquaint self with shop environment and hazards.
   b. Acquaint self with emergency procedures and policy.
   c. Accept responsibility for personal well-being and practice and follow safety guidelines.
   d. Acquaint self with material safety data sheets and chemical used in shop.

   **Performance Standards**
   
   *You will demonstrate your competence:*
   
   o when learner completes safety assignments and written exam at a satisfactory level.

   *Your performance will be successful when:*
   
   o learner observes and practices safety procedures.

2. **Demonstrate an understanding of electrical fundamentals and concepts**

   **Learning objectives**
   
   *What you will learn as you master the competency:*
   
   a. Describe electrical voltage, current, induction, and resistance characteristics.
   b. Describe basic circuit design and operation characteristics.
   c. Identify various electrical components and their operational purpose within various electrical systems.

   **Performance Standards**
   
   *You will demonstrate your competence:*
   
   o When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
   o When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision-entry level).

   *Your performance will be successful when:*
   
   o learner is productive, works safely, and in a professional manner while working on task requirements listed in related learning plan.
   o learner provides acceptable oral and/or written responses to questions and /or situations asked by the instructor, while working on the task requirements listed in related learning plan.
   o learner actively participates in the task requirements listed in the related learning plan.
   o learner attends required class and lab sessions and shows up on time.

3. **Diagnose and repair various electrical / electronic vehicle system concerns using a strategy-based process.**

   **Learning objectives**
   
   *What you will learn as you master the competency:*
   
   a. Perform trouble-shooting process on electrical components and systems using industry standard tooling, equipment and reference information.
**Performance Standards**

You will demonstrate your competence:

- When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).

- When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision-entry level).

Your performance will be successful when:

- The learner is productive, works safely, and in a professional manner while working on task requirements listed in the related learning plan.

- The learner provides acceptable oral and/or written responses to questions and/or situations asked by the instructor, while working on the task requirements listed in the related learning plan.

- The learner actively participates in the task requirements listed in the related learning plan.

- The learner attends required class and lab sessions and shows up on time.

4. Diagnose and repair various diesel starting system concerns using a strategy-based process.

**Learning objectives**

What you will learn as you master the competency:

a. Determine root cause of various vehicle starting (cranking) related problems.

b. Perform starter bench inspection and testing processes.

**Performance Standards**

You will demonstrate your competence:

- When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).

- When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision-entry level).

Your performance will be successful when:

- The learner is productive, works safely, and in a professional manner while working on task requirements listed in the related learning plan.

- The learner provides acceptable oral and/or written responses to questions and/or situations asked by the instructor, while working on the task requirements listed in the related learning plan.

- The learner actively participates in the task requirements listed in the related learning plan.

- The learner attends required class and lab sessions and shows up on time.

5. Diagnose and repair various diesel charging system concerns using a strategy-based process.

**Learning objectives**

What you will learn as you master the competency:

a. Determine root cause of various vehicle charging system problems on car.

b. Perform alternator bench inspection and testing processes.
Performance Standards
You will demonstrate your competence:

- When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision-entry level).

Your performance will be successful when:

- Learner is productive, works safely, and in a professional manner while working on task requirements listed in related learning plan.
- Learner provides acceptable oral and/or written responses to questions and/or situations asked by the instructor, while working on the task requirements listed in related learning plan.
- Learner actively participates in the task requirements listed in the related learning plan.
- Learner attends required class and lab sessions and shows up on time.

6. Diagnose and repair electrical accessory and safety system (lights, horn, windshield wipers, alarm, and shut down systems) using manufacture recommended techniques.

Learning objectives
What you will learn as you master the competency:

a. Determine reason for the electrical component and system malfunction and repair per manufacturer’s requirement.
b. Perform proper lighting, horn, wipers, alarm, shut down, and safety electrical system service and repair processes.

Performance Standards
You will demonstrate your competence:

- When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision-entry level).

Your performance will be successful when:

- Learner is productive, works safely, and in a professional manner while working on task requirements listed in related learning plan.
- Learner provides acceptable oral and/or written responses to questions and/or situations asked by the instructor, while working on the task requirements listed in related learning plan.
- Learner actively participates in the task requirements listed in the related learning plan.
- Learner attends required class and lab sessions and shows up on time.

7. Perform industry standard electrical repairs on various diesel electrical systems.

Learning objectives
What you will learn as you master the competency:

a. Perform proper electrical wire and connector repair.
**Performance Standards**

You will demonstrate your competence:

- When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision-entry level).

Your performance will be successful when:

- Learner is productive, works safely, and in a professional manner while working on task requirements listed in related learning plan.
- Learner provides acceptable oral and/or written responses to questions and/or situations asked by the instructor, while working on the NATEF task requirements listed in related learning plan.
- Learner actively participates in the task requirements listed in the related learning plan.
- Learner attends required class and lab sessions and shows up on time.

**Types of Instruction**

Classroom Presentation
Lab
Individualized/Independent Study
Simulated or Actual Work Experience

**Grading Information**

**Grading Rationale**

Grading Weights

Lab=45%
Class (Includes Test and Assignments)=45%
Final Exam (Post Test is the Final)=10%

Grading Methods

Class score calculation-
Quizzes, assignments and job sheet points shall be added and carry a weight equal to one test score.
All exams except the final shall have equal weight (test scores averaged) and used in class score calculations.
The final (post test) will be worth at least 10% of the overall final grade calculation.

Lab score calculation-
Instructor should evaluate each student's work habits using lab time card.
Each student should be evaluated on productivity and progress on task requirements, working in a professional manner, clean-up and safe work habits. Instructor is also required to evaluate each student's skill level in achieving the NATEF task requirement outlined in the various learning plans.
Instructors are encouraged to reward students for showing up on time and attending each class and lab session. This can be done by requiring students to make arrangements with the instructor to make-up any lost time prior to missed day. All students need to notify the instructor of sick days through voice mail, etc. on the day of sickness. Instructors should not allow for any work to be turned in late or any test made up without some type of deduction for late assignments/test. Suggested deduction 50% of original score.

**Grading Scale**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
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<tbody>
<tr>
<td>A</td>
<td>90% - 100%</td>
</tr>
<tr>
<td>B</td>
<td>80% - 89%</td>
</tr>
<tr>
<td>C</td>
<td>70% - 79%</td>
</tr>
<tr>
<td>D</td>
<td>60% - 69%</td>
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<tr>
<td>F</td>
<td>Below 60%</td>
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Pass/Fail  
A non-major student may choose to have a grade of P or F rather than a letter grade. A grade of P will require that the student receive a percentage grade of at least 68%. A grade less than this will result in a grade of F.