Diesel Computerized System Controls
Course Design
2006-2007

Course Information
Organization          Eastern Arizona College
Division             Industrial Technology Education
Course Number        AUT 225
Title                Diesel Computerized System Controls
Credits              2
Developed by         Brian Coppola
Lecture/Lab Ratio    1 Lecture/3 Lab
Transfer Status      Non-transferable
Activity Course      No
CIP Code             47.0605
Assessment Mode      Pre/Post Test (25 Questions/100 Points)
Semester Taught      Spring
GE Category          None
Separate Lab         No
Awareness Course     No
Intensive Writing Course No

Prerequisites
AUT 109 or instructor approval

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 automotive vehicle's computerized systems.

Goals
The goal of this course is to adequately prepare the individual to service electronic components on the engine / power train controls, on CAT heavy equipment.
Description
Provides a study of diesel equipment power train electronic control systems and addresses electronic principles. Includes an in-depth study of electronic engine/power train control operation, component operation, trouble shooting techniques, and proper repair of these systems. This course requires that each student have basic skills and knowledge in electrical/electronic fundamentals and prepares the student to take the ASE tests which have electrical/electronic or computer control system questions.

Textbooks

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**
   
   *Competence will be demonstrated:*
   
   o when learner completes safety assignments and written exam at a satisfactory level.
   
   *Criteria - Performance will be satisfactory when:*
   
   o learner observes and practices safety procedures.

2. **Diagnose computerized diesel equipment hard code failures using a strategy-based process.**
   
   **Learning objectives**
   
   *What you will learn as you master the competency:*
   
   a. Perform preliminary diagnosis process and interpret scan tool codes and PID data.
   b. Test mechanical condition of engine.
   c. Utilize service reference material to help isolate systems fault.

   **Performance Standards**
   
   *Competence will be demonstrated:*
   
   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 competed with limited supervision - entry level.)
3. **Diagnose computerized diesel equipment with intermittent operational concerns by isolating system faults using a strategy-based process.**

**Learning objectives**

*What you will learn as you master the competency:*

a. Perform preliminary diagnostic process and interpret scan tool data.

b. Test mechanical condition of engine.

c. Perform trouble-shooting techniques to test for proper operation of fuel, air induction, and exhaust systems.

d. Utilize service reference material to help isolate system component failures.

**Performance Standards**

*Competence will be demonstrated:*

- 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 competed with limited supervision - entry level.)

**Criteria - Performance will be satisfactory 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.

4. **Perform repair on isolated computerized systems faults.**

**Learning objectives**

*What you will learn as you master the competency:*

a. Demonstrate the ability to make proper repair to computerized system.

b. Verify the repair solves the original concern.

**Performance Standards**
Competence will be demonstrated:

- 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 competed with limited supervision - entry level.)

Criteria - Performance will be satisfactory 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 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 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 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</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
</tr>
<tr>
<td>B</td>
<td>80-89.9%</td>
</tr>
<tr>
<td>C</td>
<td>70-79.9%</td>
</tr>
<tr>
<td>D</td>
<td>60-69.9%</td>
</tr>
<tr>
<td>F</td>
<td>0-59.9%</td>
</tr>
</tbody>
</table>

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.