

\_\_\_\_\_ SOUTH SEATTLE COMMUNITY COLLEGE \_\_\_\_\_

Technical Education Division

### COURSE OUTLINE

Revision: Doug Clapper-2008

|                 |  |
|-----------------|--|
| DEPARTMENT:     | Heavy Duty Diesel Technology               |
| CURRICULLUM:    | Diesel and Heavy Duty Equipment Technology |
| COURSE TITLE:   | Batteries, Generators and Alternators      |
| COURSE NUMBER:  | HDM 104                                    |
| TYPE OF COURSE: | Vocational Preparatory                     |
| COURSE LENGTH:  | 96 Hours                                   |
| CREDIT HOURS:   | 6  |
| LECTURE HOURS:  | 30   |
| LAB HOURS:      | 66   |
| CLASS SIZE:     | 18 maximum                                 |
| PREREQUISITES:  | HDM 102 (Electrical-Electronics, Basic)    |

#### COURSE DESCRIPTION:

Covers the theory and operation of batteries, generators and alternators. Diagnosis and repair of charging systems components and wiring is included. Use of common test equipment is also included in this unit.

#### STUDENT LEARNING OUTCOMES ADDRESSED:

1. Critical Thinking and Problem Solving - Think critically to evaluate information found on the repair order and received verbally from shop personnel.
2. Computation - Use math to determine the correct specifications for load testing and charging batteries.

## GENERAL COURSES OBJECTIVES:

At the end of the course the student will:

1. Identify and test batteries common to the industry.
2. Identify, test and repair generators and charging systems.
3. Identify, test and repair alternator charging systems.

| TOPICAL OUTLINE:                    | APPROX. HOURS |
|-------------------------------------|---------------|
| I. Battery safety                   | 5             |
| II. Battery Maintenance             | 15            |
| Charging system Troubleshooting     | 16            |
| Charging system Repair              | 5             |
| Generator testing and repair        | 15            |
| Alternator testing and repair       | 20            |
| Wiring Harness and connector repair | <u>20</u>     |
| TOTAL                               | 96            |

## Program Outcomes

1. Identify function, read diagrams and manufacturer specifications, inspect, diagnose problems, replace/repair, and service all major components of heavy duty equipment and vehicles. (SLO 1.1 & 7.2)
2. Using IVISDS sheets, OSHA and WISHA standards, demonstrate safety procedures relating to equipment, personal safety, and safety of others. (SLO 6.4)
3. Demonstrate proficiency in using hand and electronic testing and repair equipment. (SLO 6.3)
4. Consistently apply standards and guidelines for safe work procedures. (SLO 6.4 & 6.5)
5. Work independently and in groups to service, complete repairs, test, and maintain heavy duty vehicles to meet industry standards. (SLO 3.1)
6. Use industry tools to measure service. (SLO 2.2)
7. Use technology to test and repair equipment. (SLO 5.1)
8. Identify and strategize own career plans within the field. (SLO 6.2)

9. Practice good customer service. (SLO 3.2)
10. Work with accuracy, dependability, proficiency and speed when servicing equipment. (SLO 6.1)
11. Explain the expectations of employers for employees within the diesel industry. (SLO 7.1)
12. Communicate and document service records. (SLO 1.2)
13. Demonstrate basic competency in use of computers to access repair/replacement data and to document service. (SLO 5.1 & 7.1)

## Student Learning Outcomes (SLO)

STUDENT LEARNING OUTCOMES are the knowledge and abilities every student graduating with a certificate or degree from South Seattle Community College will have. Students will achieve these outcomes as well as the specific curriculum outcomes for their academic or technical area of study.

### **1. Communication**

- 1.1 Read and listen actively to learn and communicate.
- 1.2 Speak and write effectively for personal, academic and career purposes.

### **2. Computation**

- 2.1 Use arithmetic and other basic mathematical operations as required by program of study.
- 2.2 Apply quantitative skills for personal, academic, and career purposes.
- 2.3 Identify, interpret and utilize higher level mathematical and cognitive skills (for those students who choose to move beyond the minimum requirements are stated above).

### **3. Human Relations**

- 3.1 Use social interactive skills to work in groups effectively.
- 3.2 Recognize the diversity of cultural influences and values.

### **4. Critical Thinking and Problem-Solving**

- 4.1 Think critically in evaluating information, solving problems and making decisions.

### **5. Technology**

- 5.1 Select and use appropriate technological tools for personal, academic and career tasks.

### **6. Personal Responsibility**

- 6.1 Be motivated and able to continue learning and adapt to change.
- 6.2 Value one's own skills, abilities, ideas and art.
- 6.3 Manage personal health and safety.

6.4 Be aware of civic and environmental issues.

**7. Information Literacy**

7.1 Access and evaluate information from a variety of sources and contexts, including technology.

7.2 Use information to achieve personal, academic, and career goals, as well as to participate in a democratic society.

REVISED BY: Doug Clapper  
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