

COURSE OUTLINE
Revision: Doug Clapper-2012

DEPARTMENT:	Heavy Duty Diesel Technology
CURRICULUM:	Diesel and Heavy Duty Equipment Technology
COURSE TITLE:	Diesel Engine Repair and Performance
COURSE NUMBER:	HDM 123
TYPE OF COURSE:	Vocational Preparatory
COURSE LENGTH:	195 Hours
CREDIT HOURS:	12
LECTURE HOURS:	55
LAB HOURS:	140
CLASS SIZE:	18 Maximum
PREREQUISITES:	HDM101 (Introduction to Heavy Duty) or instructor's permission

COURSE DESCRIPTION:

The students will study and perform diagnosis, repair, tune-up, and servicing procedures on current diesel engines used in the heavy-duty truck and equipment industry. Students will disassemble, clean and inspect engines and components installing replacement parts as needed. Instruction in safety, environmental awareness, human relations and leadership are taught as integral part of this unit of study.

STUDENT LEARNING OUTCOMES ADDRESSED:

1. Communication - Read and listen actively to better communicate with co-workers and customers.

2. Computation - Use basic mathematical skills as they apply measurement of diesel engine components.
3. Technology - Select and uses appropriate technological tools to repair and service diesel engines.

GENERAL COURSE OBJECTIVES:

At the end of the course the student will:

1. Follow safe work procedures
2. Identify diesel engines commonly used in the heavy duty equipment industry.
3. Perform service procedures on commonly used diesel engines.
4. Test and evaluate engine performance.
5. Repair diesel engines to industry standards.
6. Replace major accessory components, i.e., air compressors, fuel pumps and turbo charges.
7. Adjust the valves and inspect.

TOPICAL OUTLINE:		APPROX. HOURS
I	Introduction to Diesel Engines	5
	A Diesel versus Gasoline Engines	
	B Diesel Engine History	
II	Shop Safety	5
III	Tools, precision tools	10
IV	Principles of operations	15
V	Engine blocks	10
VI	Crankshafts	10
VII	Pistons, rings, and connecting rods	10
VIII	Cylinder heads and related components	10
IX	Camshaft and valve train components	10
X	Lubrication systems	10
XI	Cooling systems	10
XII	Air intake systems	10
XIII	Exhaust systems	10
XIV	Basic fuel systems	15
XV	Injections system fundamentals	10
XVI	Electronic engine controls and fuel injection	<u>45</u>
TOTAL		195

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
DATE: September 2012