

## FLORIDA STATE COLLEGE AT JACKSONVILLE

## NON-COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: DIM 0152

COURSE TITLE: Maintenance and Troubleshooting II

PREREQUISITE(S): None

COREQUISITE(S): None

STUDENT ADVISING NOTES: DIM 0151

TOTAL CONTACT HOURS: 120

(For Office Use Only:  
Vocational Credits 4 )

FACULTY WORKLOAD POINTS: 4.26

STANDARDIZED CLASS SIZE  
ALLOCATION: 20

## COURSE DESCRIPTION:

This course is a continuation of Maintenance and Troubleshooting Diesel Engines I and is designed to provide practical experience and entry-level job skills to perform an engine tune-up on a Detroit Diesel 8V-71 and Caterpillar 1100 series diesel engine. Topics included are exhaust valve clearance, governor gaps, no-load speed, idle speed, injection timing valves and buffer screws. Injection testing, timing and adjustments will also be covered.

SUGGESTED TEXT(S): Diesel Mechanics, 3rd Edition, Shulz and Evridge  
Diesel Mechanics Workbook, 3rd Edition, Shulz and Evridge

IMPLEMENTATION DATE: Fall Term, 1989 (981)

REVIEW OR MODIFICATION DATE: Fall Term, 2002 (20031)  
Fall Term 2008 (20091) - Outline Review 2007

## COURSE TOPICS

CONTACT HOURS  
PER TOPIC

I. Caterpillar Diesel Engine Servicing

54

II. Detroit Diesel Engine Servicing

74

PROGRAM TITLE: Heavy Duty Bus and Truck Mechanics  
COURSE TITLE: Maintenance and Troubleshooting II  
CIP NUMBER: 0647.060501

## LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLE(S):

12.0 TROUBLESHOOT AND REPAIR ENGINE SYSTEMS--The student will be able to:

- 12.01 Troubleshoot and repair cooling systems.
- 12.02 Troubleshoot and repair lubrication systems.
- 12.03 Troubleshoot and repair induction and exhaust systems.
- 12.04 Troubleshoot and repair diesel fuel-injection systems and components.
  - a. Inspect for operation and condition of the parts and systems, including fuel quality and consumption, safety shut-down devices, circuits, sensors, electronic governors, and flywheel.
  - b. Prime and bleed fuel-injection system.
  - c. Remove, test, and adjust injectors and nozzles.
  - d. Troubleshoot mechanical governors.
  - e. Remove, repair, and replace individual components as needed.

13.0 REBUILD A CYLINDER-HEAD ASSEMBLY--The student will be able to:

- 13.01 Diagnose valve and head problems using the visual inspection method.
- 13.02 Diagnose valve and head problems using the compression-tester or cylinder air-pressure method.
- 13.03 Diagnose valve and head problems using the stethoscope method.
- 13.04 Disassemble engines.
- 13.05 Clean and inspect the heads for cracks, warpage, and injector sleeves.
- 13.06 Inspect the valve seat and check for warpage, burns, cracks, and stem and tip wear.
- 13.07 Grinds valve seats and reface valves.
- 13.08 Check and inspect springs for free height, distortion, and installed height.
- 13.09 Adjust the valve lash.

14.0 REMOVE AND REPLACE CAMSHAFT ASSEMBLIES--The student will be able to:

- 14.01 Remove and inspect camshaft bearings and lifters.
- 14.02 Time valve-drive assemblies.

15.0 REBUILD A BLOCK ASSEMBLY--The student will be able to:

- 15.01 Remove the pistons from the rod assemblies.
- 15.02 Measure out-of-round and cylinder taper using a dial bore gauge or micrometer.
- 15.03 Check the piston pins and boss for wear.
- 15.04 Measure the piston ring lands width, out-of-round, and taper.
- 15.05 Measure the piston ring gap in a cylinder bore.

## LIST PERFORMANCE STANDARD ADDRESSED: (CONTINUED)

NUMBER(S):

TITLE(S):

- 15.06 Install and fit the piston pins.
- 15.07 Check the rod-and-piston assembly alignment.
- 15.08 Remove and replace the rod bearings.
- 15.09 Hone and clean the cylinders.
- 15.10 Install rings on the pistons.
- 15.11 Measure and check the crankshafts with a micrometer.
- 15.12 Check the bearing bore with a telescope gauge.
- 15.13 Reassemble engines using a plastic gauge.
- 15.14 Install oil seals.
- 15.15 Check for end play.



**FLORIDA STATE COLLEGE AT JACKSONVILLE  
At Jacksonville**

**Course Learning Outcomes & Assessment**

NOTE: Use either the Tab key or mouse click to move from field to field. The box will expand to accommodate your entry.

<b>Section 1</b>	
<b>COURSE PREFIX AND NUMBER: DIM 0152</b>	<b>SEMESTER CREDIT HOURS:</b>
<b>COURSE TITLE: Maintenance and Troubleshooting II</b>	

**Section 2**

**TYPE OF COURSE: (Click on the box to check all that apply)**

<input type="checkbox"/> AA Elective	<input type="checkbox"/> AS Required Professional Course	<input type="checkbox"/> College Prep
<input type="checkbox"/> AS Professional Elective	<input type="checkbox"/> AAS Required Professional Course	<input type="checkbox"/> Technical Certificate
<input type="checkbox"/> Other	<input checked="" type="checkbox"/> PSAV	<input type="checkbox"/> Apprenticeship
<input type="checkbox"/> General Education: (For General Education courses, you must also complete Section 3 and Section 7)		

**Section 3 (If applicable)**

**INDICATE BELOW THE DISCIPLINE AREA FOR GENERAL EDUCATION COURSES:**

<input type="checkbox"/> Communications	<input type="checkbox"/> Social & Behavioral Sciences	<input type="checkbox"/> Mathematics
<input type="checkbox"/> Natural Sciences	<input type="checkbox"/> Humanities	

**Section 4**

**INTELLECTUAL COMPETENCIES:**

<input checked="" type="checkbox"/> Reading	<input type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis	<input type="checkbox"/> Quantitative Skills	<input type="checkbox"/> Scientific Method of Inquiry
<input checked="" type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input checked="" type="checkbox"/> Information Literacy	<input type="checkbox"/> Ethical Judgment	<input type="checkbox"/> Working Collaboratively

<b>Section 5</b>	
<b>LEARNING OUTCOMES</b>	<b>METHOD OF ASSESSMENT</b>
Demonstrate an understanding of automotive mechanics	Written test, NATEF Authentic Task Observation (NATO)
Demonstrate proficiency in servicing cooling system and components	Written test, NATEF Authentic Task Observation (NATO)
Demonstrate proficiency in engine repair service	Written test, NATEF Authentic Task Observation (NATO)

**Section 6**

Name of Person Completing This Form: Jacob Alliton Date: Oct 31 2007