FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER:	AER 1198
COURSE TITLE:	Engines
PREREQUISITE(S):	AER 1081C
COREQUISITE(S):	None
CREDIT HOURS:	4
CONTACT HOURS/WEEK:	6
CONTACT HOUR BREAKDOWN:	
Lecture/Discussion:	4
Laboratory:	2
Other _____:	
FACULTY WORKLOAD POINTS:	5
STANDARDIZED CLASS SIZE ALLOCATION:	24

COURSE DESCRIPTION:

This course is designed to provide instruction in the repair, diagnosis and disassembly of engines and reconditioning of short block, cylinder heads, valve trains, engine sealing and reassembly. Students enrolled in Dealer Specific programs (GM ASEP and Ford MLR) will work with manufacturer supplied curriculum and vehicles.

SUGGESTED TEXT(S):	Chek-Chart Automotive Engine Repair and Rebuilding, 4th ed, Prentice Hall
IMPLEMENTATION DATE:	Fall Term, 1991 (921)
REVIEW OR MODIFICATION DATE:	Fall Term, 1993 (941) Fall Term, 1998 Spring Term, 1999 Fall Term, 2002 (20031) Fall Term 2005 (20061) Fall Term 2008 (20091)

COURSE TOPICS	CONTACT HOURS PER TOPIC
I. Introduction-Automotive Engines	3
A. Engine Classification	
B. Engine Measurement and Performance	
C. Engine Identification	
D. Engine Diagnostics	
E. Other Engine Designs	
II. Engine Disassembly	17
A. Engine Removal	
B. Engine Disassembly and Inspection	
C. Cleaning Engine Parts	
D. Crack Repair	
III. Short Blocks	12
A. Cylinder Blocks	
B. Crankshafts	
C. Installing Pistons and Connecting Rods	
IV. Cylinder Heads and Value	12
A. Cylinder Head	
B. Assembling the Cylinder Head	
V. Camshafts & Valve Train Inspection	20
A. Camshafts	
B. Camshafts and Valve Train Inspection	
C. Installing the Camshaft	
D. Installing the Cylinder Head and Valve Train	
E. Installing the Timing Components	
VI. Lubricating and Cooling Systems	10
A. Lubrication	
B. Lubricating Systems	
C. Oil Pump Inspection and Service	
D. Cooling Systems	
E. Cooling Systems Servicing	

COURSE TOPICS (CONTINUED)	CONTACT HOURS PER TOPIC
VII. Engine Sealing and Reassembly	16

A. Fasteners
B. Gaskets
C. Adhesives, Sealants, and Other Chemical Sealing Materials
D. Oil Seals
E. Other Seals
F. Engine Reassembly
G. Installing the Engine

PROGRAM TITLE: Automotive Service Management Technology

COURSE TITLE: Engines

CIP NUMBER: 0615.080300

LIST PERFORMANCE STANDARD ADDRESSED:

NUMBER(S): TITLES(S):

01.0 DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS -- The student will be able to:

- 01.01 Apply shop safety rules and procedures.
- 01.02 Use and maintain hand tools such as screwdrivers, special application pliers, hammers, chisels, punches, special application wrenches and sockets, files, hacksaws, bench vises and "C" clamps.
- 01.03 Demonstrate use of precision measuring tools.
- 01.04 Use and install fasteners such as screws and bolts, key screw extractors, helicoil inserts and thread cutting taps and dies.
- 01.05 Use and maintain power tools such as drills, bench grinders, drill presses, hydraulic presses, impact wrenches, air chisels, parts washers, hydraulic jacks and vehicle hoists.
- 01.06 Apply basic math skills.
- 01.07 Use and apply metric and English measurement skills.
- 01.08 Demonstrate an understanding of lubrication requirements.
- 01.09 Inspect, remove, replace and adjust all belts.
- 01.11 Demonstrate use of technical manuals, specification handbooks and charts.
- 01.18 Demonstrate an understanding of basic heating and cooling systems.
- 01.20 Demonstrate knowledge of engine components.
- 01.21 Demonstrate an understanding of basic ignition and fuel systems.
- 01.29 Demonstrate knowledge of internal engine components.
- 01.53 Check and adjust specified fluid levels.

02.0 APPLY ELECTRICAL AND ELECTRONIC SKILLS IN DIAGNOSING/TROUBLESHOOTING MALFUNCTIONS OF ELECTRICAL/ELECTRONIC COMPONENTS -- The student will be able to:

- 02.20 Diagnose engine malfunctions.

05.0 DEMONSTRATE PROFICIENCY IN SERVICING COOLING, AIR CONDITIONING AND HEATING SYSTEMS -- The student will be able to:

- 05.01 Diagnose overheating problems.
- 05.02 Check radiator coolant level.
- 05.03 Test and add coolant. (ASE)
- 05.04 Pressure test cooling systems. (ASE)
- 05.05 Test radiator caps. (ASE)
- 05.06 Inspect, remove and replace radiator and heater hoses. (ASE)
- 05.07 Remove, test and replace thermostats. (ASE)
- 05.08 Flush cooling systems and replace coolant.
- 05.09 Remove and replace radiators. (ASE)

LIST PERFORMANCE STANDARD ADDRESSED: (Continued)

NUMBER(S): TITLES(S):

05.10 Remove and replace water pumps.
05.19 Remove and replace engine fan clutches and electric cooling fan and controls.

09.0 DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE -- The student will be able to:

09.01 Clean engines. (ASE)
09.02 Remove and replace motor mounts.
09.03 Check valve guides for wear.
09.04 Reface valves and seats.
09.05 Perform cylinder balance tests.
09.06 Perform cylinder compression tests.
09.07 Perform cylinder leakage tests. (ASE)
09.08 Determine source(s) of oil/coolant loss.
09.09 Determine source(s) of excess noise. (ASE)
09.10 Determine cause(s) of overheating. (ASE)
09.11 Check the engine oil pressure.
09.12 Remove and replace core plugs. (ASE)
09.13 Inspect, remove and replace flywheels and ring gears.
09.14 Remove and replace engine assemblies. (ASE)
09.15 Remove and replace oil pans. (ASE)
09.16 Remove and replace oil pumps.
09.17 Clean cylinder blocks, oil passages and pistons.
09.18 Inspect blocks for warpage. (ASE)
09.19 Measure and inspect engine components for proper tolerances.
09.20 Remove and replace crankshafts, mains and rod bearings. (ASE)
09.21 Remove and replace camshafts and bushings. (ASE)
09.22 Remove and replace pistons and rings. (ASE)
09.23 Remove ridges and deglaze cylinder walls.
09.24 Remove and replace front and rear oil seals.
09.25 Remove and replace intake and exhaust manifolds. (ASE)
09.29 Test valve springs. (ASE)
09.30 Adjust valve lifters. (ASE)
09.31 Replace rocker arm assemblies. (ASE)
09.32 Change oil and oil filters.

Florida State College

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.

Section 1	
COURSE PREFIX AND NUMBER: **AER 1198**	SEMESTER CREDIT HOURS: **4**
COURSE TITLE: **Engines**	

Section 2

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

- ☐ AA Elective
- ☒ AS Required Professional Course
- ☐ College Prep
- ☐ AS Professional Elective
- ☒ AAS Required Professional Course
- ☐ Technical Certificate
- ☐ Other ____
- ☐ PSAV
- ☐ Apprenticeship
- ☐ 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:

- ☐ Communications
- ☐ Social & Behavioral Sciences
- ☐ Mathematics
- ☐ Natural Sciences
- ☐ Humanities

Section 4

INTELLECTUAL COMPETENCIES:

- ☒ Reading
- ☐ Speaking
- ☒ Critical Analysis
- ☐ Quantitative Skills
- ☐ Scientific Method of Inquiry
- ☒ Writing
- ☒ Listening
- ☒ Information Literacy
- ☐ Ethical Judgment
- ☒ Working Collaboratively

Section 5 **LEARNING OUTCOMES**		**METHOD OF ASSESSMENT**
•	DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS see attached framework	Written test, NATEF Authentic Task Observation (NATO)
•	Diagnose engine malfunctions	Written test, NATEF Authentic Task Observation (NATO)
•	DEMONSTRATE PROFICIENCY IN SERVICING COOLING SYSTEMS	Written test, NATEF Authentic Task Observation (NATO)
•	DEMONSTRATE PROFICIENCY IN ENGINE REPAIR SERVICE see attached framework	Written test, NATEF Authentic Task Observation (NATO)

Section 6

Name of Person Completing This Form: Jeffrey Rehkopf Date: Nov 12, 2007