

FLORIDA STATE COLLEGE AT JACKSONVILLE

NON-COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: AER 0499

COURSE TITLE: Steering and Suspension Systems

PREREQUISITE(S): AER 0001

COREQUISITE(S): None

TOTAL CONTACT HOURS: 120  
(For Office Use Only:  
Vocational Credits 4.0)

FACULTY WORKLOAD POINTS: 4.0

STANDARDIZED CLASS SIZE  
ALLOCATION: 24

COURSE DESCRIPTION:

This course is designed to teach entry-level job skills. Topics included are service and repair of steering and suspension systems, power steering, wheels and tires. This course includes a combination of classroom and shop experience. Students enrolled in Dealer Specific programs (GM ASEP and (Ford MLR) will work with manufacturer supplied curriculum and vehicles.

SUGGESTED TEXT(S): Automotive Technology, 2nd Ed., Halderman

IMPLEMENTATION DATE: Reviewed/Confirmed  
Winter Term, 1989

REVIEW OR MODIFICATION DATE: Fall Term, 1996 (971)  
Fall Term, 1998  
Fall Term, 2002 (20031)  
Spring Term, 2008 (20082), (Purge)  
Fall Term, 2008 (20091)

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Introduction	10
A. Tools	
B. Safety	
II. Basics of Steering and Suspension	45
A. Suspension and Front Wheel Drive Systems	
B. Suspension Thrust and Measurements	
C. Alignment Machine Capabilities and Prechecks	
D. Repairs and Adjustments	
III. Manual and Assisted Steering	45
A. Manual Steering Types, Sectors, and Parts	
B. Power Assist Types, Parts, and operations	
C. Power Steering Pumps	
D. Repairs and Adjustments	
IV. Introduction to Wheels and Tires	20
A. Tire/Wheel types and construction	
B. Tire Rotation and Balancing	

PROGRAM TITLE: Automotive Service Technology  
COURSE TITLE: Steering and Suspension Systems  
CIP NUMBER: 0647.060400

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 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.
- 01.10 Perform auto safety inspection.
- 01.11 Demonstrate use of technical manuals, specification handbooks and charts.
- 01.12 Demonstrate an understanding of steering geometry and suspension geometry such as caster camber, toe-in, king pin inclination (steering axis) and toe-in and toe-out on turns.
- 01.13 Demonstrate an understanding of the function of steering suspension system components such as coil springs, leaf springs, torsion bars, twin "I" beams, quadralink, rubber bushings, shock absorbers, tie rods, bail joints, shackles, idler arm, pitman arm and control arm.
- 01.14 Demonstrate an understanding of manual and power steering operation such as power steering pump, Power steering control valve and power steering fluid leaks.
- 01.46 Install air shocks.

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS - The student will be able to:

- 03.01 Diagnose suspension problems.
- 03.02 Diagnose wheel/tire vibrations, shimmy and tramp.
- 03.03 Diagnose steering problems.
- 03.04 Lubricate suspension, steering gear and linkage. (ASE)
- 03.05 Check manual steering gear fluid level. (ASE)
- 03.06 Inspect steering systems. (ASE)
- 03.07 Inspect suspension systems. (ASE)
- 03.08 Inspect and test shock absorbers.
- 03.09 Check power steering fluid level. (ASE)
- 03.10 Inspect, repair and replace tires and wheels.
- 03.11 Rotate wheels and tires. (ASE)
- 03.12 Balance wheels. (ASE)

## LIST PERFORMANCE STANDARD ADDRESSED: (Continued)

## NUMBER(S): TITLES(S):

- 03.13 Service wheel bearings and grease seals on nondrive axles/spindles. (ASE)
- 03.14 Remove and replace spindles and ball joints. (ASE)
- 03.15 Remove and replace shock absorbers and mountings. (ASE)
- 03.16 Measure and adjust torsion bar height. (ASE)
- 03.17 Remove and replace coil springs/torsion bars. (ASE)
- 03.18 Remove and replace control arms and bushings. (ASE)
- 03.19 Remove and replace steering linkage components.
- 03.20 Remove and replace steering dampers. (ASE)
- 03.21 Remove and replace rear suspension parts. (ASE)
- 03.22 Remove and replace manual/power steering gear assemblies.
- 03.23 Check two-wheel alignment.
- 03.24 Rebuild MacPherson type struts. (ASE)
- 03.25 Overhaul recirculating ball manual gears.
- 03.26 Rebuild rack-and-pinion manual gears. (ASE)
- 03.27 Remove and replace power steering pumps, (ASE)
- 03.28 Rebuild power steering pumps.
- 03.29 Overhaul integral steering gears.
- 03.30 Rebuild rack-and-pinion power steering assembly. (ASE)
- 03.31 Check four-wheel alignment.

**08.0 DEMONSTRATE PROFICIENCY IN SERVICING MANUAL DRIVE TRAINS AND AXLES -- The student will be able to:**

- 08.14 Remove and replace drive axle bearings and seals.
- 08.18 Inspect, remove, replace and lubricate front drive axle flexible joints and boots.
- 08.19 Inspect, remove and replace constant-velocity universal joints.



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

<i>Section 1</i>	
COURSE PREFIX AND NUMBER: <u>AER 0499</u>	SEMESTER CREDIT HOURS: <u>120</u>
COURSE TITLE: <u>Steering and Suspension Systems</u>	

*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 checked="" type="checkbox"/> Working Collaboratively

Section 5	
LEARNING OUTCOMES	METHOD OF ASSESSMENT
• <u>DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE AIR CONDITIONING SYSTEMS</u> see attached framework	Written test, NATEF Authentic Task Observation (NATO)
• <u>DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE HEATING SYSTEMS</u>	Written test, NATEF Authentic Task Observation (NATO)
• <u>SERVICING AUTOMOTIVE AIR CONDITIONING SYSTEMS</u>	Written test, NATEF Authentic Task Observation (NATO)
• <u>DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE HEATING SYSTEMS</u>	Written test, NATEF Authentic Task Observation (NATO)
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*Section 6*

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