

FLORIDA STATE COLLEGE AT JACKSONVILLE

COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: AER 1598

COURSE TITLE: Brake Systems

PREREQUISITE(S): AER 1694C

COREQUISITE(S): None

CREDIT HOURS: 4

CONTACT HOURS/WEEK: 6

Lecture/Discussion: 4

Laboratory: 2

Other _____:

FACULTY WORKLOAD POINTS: 5

STANDARDIZED CLASS SIZE ALLOCATION: 24

COURSE DESCRIPTION:

This course is designed to teach job entry skills in the theory, operation, and repair of brake systems, including both drum and disc brakes. Students enrolled in Dealer Specific programs (GM ASEP and Ford MLR) will work with manufacturer supplied curriculum and vehicles. Both classroom lecture and laboratory will be provided.

SUGGESTED TEXT(S): Chek-Chart Automotive Brake Systems, 4th ed, 2005

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 2007 (20081)
 Fall Term, 2008 (20091)

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Introduction	3
A. Tools	
B. Safety	
II. Brake Systems	12
A. Friction	
B. Principles of Hydraulic Brake Systems	
C. Hydraulic Brake System Components	
D. Hydraulic System Safety Switches and Valves	
E. Drum and Disc Brake Assemblies	
F. Hydraulic System Service	
G. Hydraulic Assist Power Brakes	
IV. Drum Brakes	18
A. Drum Brake Operation and Complements	
B. Drum Brake Designs	
C. Drum Brake Inspection	
D. Brake Shoes and Linings	
E. Drum Parking Brakes	
V. Disc Brakes	18
A. Disc Brake Components and Their Function	
B. General Caliper Inspection and Servicing	
C. Rotor Inspection and Servicing	
VI. Anti-Lock Brake Systems	18
A. Pressure Modulation	
B. Pedal Feel	
C. Type of ABC	
D. Integrated ABC System Components	
E. Integrated System Operation	
F. Non-Integrated ABC Operation	
G. Anti-Lock Brake System Service	
H. Diagnosis and Testing	
I. Automatic stability (Traction Control)	

COURSE TOPICS (CONTINUING)

CONTACT HOURS
PER TOPIC

VII. Brake Drum and Rotor Machining

21

PROGRAM TITLE: Automotive Service Management Technology

COURSE TITLE: Brake Systems

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.
- 01.06 Apply basic math skills.
- 01.07 Use and apply metric and English measurement skills.
- 01.10 Perform auto safety inspection.
- 01.11 Demonstrate use of technical manuals, specification handbooks and charts.
- 01.15 Demonstrate an understanding of drum brake operation such as adjusters, wheel cylinder, pull, grab, chatter, noise, pulsations, fade and lining conditions.
- 01.16 Demonstrate an understanding of disk brake operation such as caliper, piston, pull, grab, chatter, pulsations, fade and lining conditions.
- 01.17 Demonstrate an understanding of brake system valve operation such as pressure differential valve, proportional valve, metering valve and brake warning light.
- 01.53 Check and adjust specified fluid levels.

03.0 DEMONSTRATE PROFICIENCY IN SERVICING STEERING, SUSPENSION AND WHEEL SYSTEMS --

The student will be able to:

- 03.13 Service wheel bearings and grease seals on non-drive axles/spindles. (ASE)

04.0 DEMONSTRATE PROFICIENCY IN SERVICING AUTOMOTIVE BRAKE SYSTEMS -- The student will be able to:

- 04.01 Diagnose brake system problems.
- 04.02 Diagnose combination valve malfunctions.
- 04.03 Perform operational inspections.
- 04.04 Inspect brake assemblies.
- 04.05 Remove and replace calipers and rotors. (ASE)
- 04.06 Refinish rotors. (ASE)
- 04.07 Rebuild calipers. (ASE)
- 04.08 Refinish brake drums. (ASE)
- 04.09 Replace drum brake shoes and disc pads. (ASE)

LIST PERFORMANCE STANDARD ADDRESSED: (CONTINUED)

NUMBER(S): TITLES(S):

- 04.10 Inspect and replace brake lines and hoses. (ASE)
- 04.11 Adjust brake shoes. (ASE)
- 04.12 Adjust parking brakes. (ASE)
- 04.13 Rebuild wheel cylinders. (ASE)
- 04.14 Remove and replace wheel cylinders. (ASE)
- 04.15 Bleed Hydraulic brakes. (ASE)
- 04.16 Repair or replace parking brake cables and linkage. (ASE)
- 04.17 Remove and replace master cylinders. (ASE)
- 04.18 Remove and replace hydraulic power cylinders.
- 04.19 Flush brake systems. (ASE)
- 04.20 Service and repair power assist and brake control systems.
- 04.21 Service and repair front and rear disc brakes.
- 04.22 Replace hydraulic brake boosters. (ASE)
- 04.23 Inspect, diagnose and repair anti-locking brake systems.

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. (ASE)



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>AER1410</u>	SEMESTER CREDIT HOURS: <u>90</u>
COURSE TITLE: <u>Brake Systems</u>	

Section 2
TYPE OF COURSE: (Click on the box to check all that apply)

<input type="checkbox"/> AA Elective	<input checked="" type="checkbox"/> AS Required Professional Course	<input type="checkbox"/> College Prep
<input type="checkbox"/> AS Professional Elective	<input checked="" type="checkbox"/> AAS Required Professional Course	<input type="checkbox"/> Technical Certificate
<input type="checkbox"/> Other _____	<input 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

<i>Section 5</i> LEARNING OUTCOMES	METHOD OF ASSESSMENT
• <u>DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE BRAKE SYSTEMS</u> see attached framework	Written test, NATEF Authentic Task Observation (NATO)
• <u>DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE BRAKE SYSTEM SERVICE</u>	Written test, NATEF Authentic Task Observation (NATO)
• <u>DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE ANTILOCK BRAKE SYSTEMS</u>	Written test, NATEF Authentic Task Observation (NATO)
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Section 6
Name of Person Completing This Form: Jacob Alliton Date: Nov 1 2007