

## FLORIDA STATE COLLEGE AT JACKSONVILLE

## COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER:	AER 1298
COURSE TITLE:	Automatic Transmissions and Transaxles
PREREQUISITE(S):	AER 1694C and AER 1398
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 seeks to develop entry level skills in the theory and repair of automatic transmissions, and transaxles. This course will concentrate on the automatic transmission/transaxles in today's vehicles, including instruction in electronic controls, overdrive transmissions, and lock-up torque converters. Students enrolled in Dealer Specific programs (GM ASEP) will work with manufacturer supplied curriculum and vehicles. Both classroom and laboratory will be provided.

SUGGESTED TEXT(S):	<u>Automotive Technology</u> , 2nd e., Halderman
IMPLEMENTATION DATE:	Spring Term, 1999
REVIEW OR MODIFICATION DATE:	Fall Term, 2002 (20031) Fall Term, 2004 (20051) Fall Term 2005 (20061) Fall Term, 2008 (20091)

COURSE TOPICS	<u>CONTACT HOURS</u> <u>PER TOPIC</u>
I. Introduction	3
A. Tools	
B. Safety	
C. Special Tools	
II. Automatic Transmissions and Transaxles Theory and Operation	15
A. Gearsets	
1. Planetary Parts	
2. Planetary Laws	
3. Shafts and Power Flow	
B. Hydraulic operation	
1. Pascals Law	
2. Pumps, Pressure Regulation and Fluid	
3. Hydraulic Clutches Assemblies	
4. Holding Devices (Bands and One-Way Clutches)	
5. Hydraulic Control Devices (Valve body and Accumulators)	
III. Automatic transmission service	3
IV. Automatic Transmission Mechanical and Hydraulic Overhaul	30
A. Inspections and Measurements	
B. Repair and Adjustments	
1. Clutch Assembly and Testing	
2. Bushing Replacement	
3. Proper Assembly Procedures	
V. Automatic Transaxle Mechanical/Hydraulic Diagnosis	10
A. Pressure and Stall Testing	
B. Road Test Procedures	
C. Range Chart	
VI. Automatic transmission torque operation and diagnosis	7
A. Parts and Operation	
B. Servicing of Units	
C. Torque Converter Clutch and Solenoid Operation	
VII. Automatic Transmission Electronics and Systems	12
A. Inputs/Sensors and Outputs/Actuators	
B. Switch Sensors	
C. Electronic Shift Basics	
D. Shift Solenoid Operation and Pressure Control/ Force Motor Operation	

## COURSE TOPICS

CONTACT HOURS  
PER TOPIC

VIII. Automatic Transmission Electronics and Systems Diagnosis	10
A. Wiring Diagrams	
B. Solenoid Testing	
C. Input Sensor Diagnosis	
D. Output/Actuator diagnosis	
Total	90

PROGRAM TITLE: Automotive Service Management Technology  
 COURSE TITLE: Automatic Transmissions and Transaxles  
 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.
- 01.11 Demonstrate use of technical manuals, specification handbooks and charts.
- 01.24 Demonstrate an understanding of automatic transmission operation such as fluid coupling, torque converter, planetary gear system, power flow, hydraulic system, lubricant and cooling.
- 01.53 Check and adjust specified fluid levels.

07.0 DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE -- The student will be able to:

- 07.01 Performance test automatic transmissions.
- 07.02 Change transmission oil and filter. (ASE)
- 07.03 Adjust linkage from the engine.
- 07.04 Adjust shift linkage. (ASE)
- 07.05 Adjust neutral safety switches.
- 07.06 Remove and replace external gaskets and seals.
- 07.07 Test vacuum shift modulator. (ASE)
- 07.08 Adjust bands. (ASE)
- 07.09 Pressure flush transmission cooler assemblies.
- 07.10 Diagnose malfunctions of automatic transmissions such as fluid leaks, fluid condition, slipping, lock up and shift problems.
- 07.11 Diagnose, repair and replace trans-axles.
- 07.12 Pressure test transmissions in vehicles. (ASE)
- 07.13 Test the electrical controls of an automatic clutch converter.
- 07.14 Service governors.
- 07.15 Service valve bodies.
- 07.16 Rebuild transmission assemblies. (ASE)
- 07.17 Rebuild automatic trans-axle.
- 07.18 Pressure flush converter assemblies.
- 07.19 Remove and replace extension housings and bushings.



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 1298</u>	SEMESTER CREDIT HOURS: <u>4.0</u>
COURSE TITLE: <u>Automatic Transmissions and Transaxles</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 checked="" 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 checked="" 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

<i>Section 5</i>	
LEARNING OUTCOMES	METHOD OF ASSESSMENT
• <u>DEMONSTRATE AN UNDERSTANDING OF AUTOMOTIVE MECHANICS - see attached framework</u>	Written test, NATEF Authentic Task Observation (NATO)
• <u>DEMONSTRATE PROFICIENCY IN AUTOMATIC TRANSMISSION/TRANS-AXLE SERVICE- see attached framework</u>	Written test, NATEF Authentic Task Observation (NATO)
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*Section 6*

Name of Person Completing This Form: Paul Soar Date: 2/16/2008