

Division: Business & Engineering Technologies

REVISED:Spring 2012

Curricula In Which Course Is Taught: Automotive Analysis & Repair

Course Number and Title: AUT 251 Automatic Transmissions

Course Credits 4 Lecture 2 Hours/Week Laboratory 6 Hours/Week

I. Course Description :

Studies several types of automatic transmissions, torque converters, and their principles of operation. Includes adjustment, maintenance, and building.

II. Relationship of the Course to Curriculum Objectives:

Students will:

- I. demonstrate technical competencies & skills in automatic transmissions/transaxle repair
- II. demonstrate punctuality & reliability acceptable to the auto repair industry
- III. use safety equipment & procedures required for the tasks being performed
- IV. read & interpret technical information required for projects & assignments
- V. demonstrate and maintain a clean, orderly, safe & attractive work place & maintain a personal appearance that will enhance that work place

III. Requirements : Textbook, tool set, work clothes

Automotive Technology by Halderman/Mitchell, latest edition, published by Prentice Hall

IV. Course Objectives:

Identify and interpret transmission concern; assure engine operation
Research vehicle and service info: history, precautions, bulletins
Locate and interpret vehicle component identification numbers
Diagnose fluid usage, level, conditions; determine actions needed
Perform transmission tests: pressure, stall & lock-up converter test
Diagnose electronic, mechanical, hydraulic, vacuum control concerns
Diagnose noise & vibration concerns
Diagnose gear reduction/multiplication concerns (power flow)
Inspect and adjust linkages, cables & sensors
Service transmission; perform visual inspection
Inspect and repair/replace vacuum modulator lines and hoses as needed
Inspect, repair, replace governor assembly
Inspect and replace external seals and gaskets
Inspect extension housing, bushings and seals; repair as needed
Inspect, leak test, flush and replace cooler, lines and fittings
Inspect and replace speedometer gears or vehicle speed sensor
Diagnose electronic transmission control system; repair as needed
Inspect, replace and align powertrain mounts
Remove and reinstall RWD transmission & FWD transaxle & torque converter
Disassemble, clean & inspect transmission/transaxle
Clean & inspect; measure valve body assembly
Inspect servo and accumulator bore, piston, seals, springs and retainers
Assemble transmission/transaxle
Inspect converter flexplate, attaching parts, pilot, pump drive and seals

Measure converter end-play, check for interference & one way clutch operation
Inspect, measure and reseal oil pump assembly
Measure gear train endplay or preload
Inspect, measure, replace thrust bearings
Inspect oil delivery rings, ring grooves and sealing surfaces
Inspect bushings
Inspect and measure planetary gear assembly
Inspect case bores, bushings, passages, vents & mating surfaces
Inspect transaxle drive, link chains, sprockets, gears, bearings and bushing
Inspect, measure, repair or replace transaxle final drive components
Inspect and reinstall parking pawl, shaft, spring and retainer
Inspect clutch drum, piston, check-balls, retainers, seals friction & pressure plates
Measure & correct clutch pack clearance
Air test clutch and servo assemblies
Inspect roller and sprag clutch assemblies
Inspect and repair/replace bands and drums

V. Learner Outcomes:

1. calculate torque multiplication/speed reduction
2. identify the parts of an automatic transmission
3. identify the parts of a torque converter
4. distinguish between the operation of the governor valve and the throttle valve
5. diagnose hydraulic systems
6. diagnose planetary gear set noise
7. diagnose improper transmission shift point causes
8. diagnose transmission problem location using a band/clutch application chart

VII. Evaluation:

Evaluated by multiple choice, fill in blank or true/false tests:

by active participation in team projects:

9. participate in the removal and disassembly of an automatic transmission/transaxle
10. participate in the diagnosis of part wear and failure
11. participate in the cleaning, repair and replacement of a transmission/transaxle
12. participate in testing a rebuilt transmission on the dyno
13. participate in pressure testing the transmission
14. participate in testing the vacuum modulator/ throttle valve operation
15. participate in testing the governor operation
16. participate in the diagnosis of transmission problems
17. 75% of students will be able to complete these assignments

VI. The following General Education Objectives will be addressed in this course:

- X Communications
- X Learning Skills
- X Critical Thinking
- Interpersonal Skills and Human Relations
- X Computational and Computer Skills

_____ **Understanding Culture and Society**

X **Understanding Science and Technology**

_____ **Wellness**