

**I. CATALOG DESCRIPTION:**

- A. Department Information:  
Division: Technical  
Department: Automotive  
Course ID: AUTO 075x3  
Course Title: Automatic Transmissions Rear Wheel Drive  
Units: 2-6  
Lecture:1-3  
Laboratory: 3-9  
Prerequisite: None
- B. Catalog and Schedule Description:  
Theory and practical work on rear wheel drive automatic transmissions in automobile and light truck applications. Course offers preparation information for the Automotive Service Excellence (ASE) A2 certification test.

**II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: Three**

**III. EXPECTED OUTCOMES FOR STUDENTS:**

Upon completion of the 1<sup>st</sup> enrollment, the student will be able to:

- A. Demonstrate appropriate shop and job safety techniques.
- B. Interpret general automatic transmission failures and document the diagnosis.
- C. Perform general maintenance and adjustments on transmission.
- D. Perform in-vehicle transmission and repair.
- E. Analyze off-vehicle transmission repair.
- F. Demonstrate job search and retention skills.

Upon completion of the 2<sup>nd</sup> enrollment, the student will be able to:

- A. Operate simple electronic transmission diagnostic equipment.
- B. Analyze failure codes and research repair documentation.
- C. Differentiate between reusable and defective parts.
- D. Demonstrate interview skills.

Upon completion of the 3<sup>rd</sup> enrollment, the student will be able to:

- A. Operate complex electronic transmission diagnostic equipment.
- B. Perform a major recondition with minimal assistance from instructor.
- C. Research rear wheel drive automatic transmission failures and upgrade transmissions as needed.

**IV. COURSE CONTENT:**

- A. Introduction to Automatic Transmission
  - 1. Course overview
  - 2. Assessment and certification
  - 3. Class rules
  - 4. Career opportunities and continuing education
  - 5. Industry ethics
- B. Safety Practices Review
  - 1. Shop and specific procedures
  - 2. Hazardous materials
    - a. Types
    - b. Storage
    - c. MSDS
    - d. Handling
    - e. Emergency procedures

3. Vehicle specific procedures
4. Power and hand tools
5. Personal safety
- C. Automatic Transmission Diagnosis
  1. Overview of transmission operation
  2. Proper safety procedures
  3. Diagnostic equipment and special tools
  4. Inspect, analyze symptoms, diagnose and service
    - a. Customer complaints
    - b. Fluid usage
    - c. Pressure test
    - d. Torque converter
    - e. Lock-up torque converter
    - f. Electrical, mechanical, and vacuum control systems
    - g. Vibrations
    - h. Torque specifications
- D. Transmission Maintenance and Adjustments
  1. Overview of maintenance and adjustment procedures
  2. Proper safety procedures
  3. Diagnostic equipment and special tools
  4. Inspect, analyze symptoms, diagnose and service
    - a. Manual shift valve
    - b. Throttle valve
    - c. TV linkages or cables
    - d. Gear selector indicator
    - e. Transmission service
    - f. Torque specifications
- E. In-vehicle Transmission Repair
  1. Overview of procedures
  2. Proper safety procedures
  3. Diagnostic equipment and special tools
  4. Inspect, analyze symptoms, diagnose and service
    - a. Vacuum modulator
    - b. Vacuum hoses and lines
    - c. Governor Assembly
    - d. External seals and gaskets
    - e. Extension housing
    - f. Fluid checks
    - g. Speedometer gear/VSS
    - h. Valve body
    - i. Servos
    - j. Accumulators
    - k. Electronic components
    - l. Electrical components
    - m. Power train mounts
    - n. Parking pawl
    - o. Torque specifications
- F. Off-vehicle Transmission Repair
  1. Overview of procedures
  2. Proper safety procedures
  3. Diagnostic equipment and special tools
  4. Perform
    - a. R&R transmission
    - b. R&R torque converter
    - c. Disassemble and inspect transmission
    - d. Assemble transmission

5. Inspect, analyze symptoms, diagnose and service
  - a. Oil pump
  - b. Flex plate
  - c. Converter
  - d. Transmission cooling system
  - e. Gear train shafts, bushings, sealing rings and case
  - f. Drive links
  - g. Bearings
  - h. Final drive
  - i. End play or preload
  - j. Thrust washers
  - k. Bushings
  - l. Vents
  - m. Mating surfaces
  - n. Clutch drum, pistons, check-balls, springs, retainers, seals, frictions and pressure plates
  - o. Clutch pack clearance
  - p. Air test
  - q. One-way clutch/sprag
  - r. Bands
  - s. Drums
  - t. Torque specifications

**V. METHODS OF INSTRUCTION:**

- A. Lecture
- B. Read text book and service manuals
- C. Small and large group discussions
- D. Manufacturer's video and computer base instructions
- E. Lab demonstrations

**VI. Typical Assignments:**

- A. Read textbook and answer questions at the end of each chapter.  
Typical Question: Explain the operation of the torque converter.
- B. Class discussion  
Typical Topic: What is a stall test and how is it performed?
- C. Manufacturer's video instruction
  1. Answer pre-test to video on rear wheel drive transmissions.
  2. Answer post-test to video, correct test, and discuss answers.
  3. Complete CD ROM training for rear wheel drive transmissions and review.
- D. Lab assignments  
Complete all required task sheets set by NATEF standards.  
Typical Assignments:
  1. Prepare to remove a rear wheel drive automatic transmission.
  2. Perform a transmission recondition on a rear wheel drive transmission.

**VII. EVALUATION(S):**

- A. Methods of evaluation:
  1. Chapter review questions
  2. Assigned laboratory projects
  3. Quizzes
  4. Midterm examination
  5. Final examinationTypical Questions:
  - a. Describe the purpose of the pressure regulator valve.
  - b. What controls the transmissions up-shifts?

6. Writing assignments  
Typical Assignments:
  - a. Research paper pertaining to automotive technology.
  - b. Compose a repair order detailing customers needed repairs.
- B. Frequency of evaluation:
  1. Textbook chapters review questions, approximately 20 chapters with ten questions per chapter
  2. Weekly assigned laboratory projects
  3. Four in class quizzes with ten critical thinking questions
  4. One midterm examination
  5. One final examination
  6. One writing assignment
- C. Levels of evaluation upon repetition:  
First enrollment students are expected to:
  1. Recognize shop safety hazards.  
Typical Questions:
    - a. What is the purpose of wearing safety glasses?
    - b. What type of footwear is allowed in the auto shop?
  2. Interpret general rear wheel drive automatic transmission failures and document.  
Typical Questions:
    - a. A 4L60E transmission has no reverse, what is the most likely cause and why?
    - b. A 4ALD transmission has higher than normal shift points, what determines the speed and timing of the shifts?
  3. Perform general maintenance and adjustments on rear wheel drive transmissions.  
Typical Questions:
    - a. How often should a rear wheel drive automatic transmission be serviced?
    - b. Why should you adjust bands?
  4. Perform in-vehicle rear wheel drive transmission repairs.  
Typical Questions:
    - a. What tools would be used to check pressure on an electronic rear wheel drive automatic transmission? Demonstrate the procedure.
    - b. What is the importance of a torque wrench? Demonstrate the proper use.
  5. Analyze off-vehicle transmission repair.  
Typical Questions:
    - a. Inspect component and determine possible cause of failure in a detailed report.
    - b. What is the endplay on the given transmission?
  6. Demonstrate job search and retention skills.  
Typical Questions:
    - a. Create a resume that gives a prospective employer your educational history, work experience, and the reason they should hire you.
    - b. Prepare for a mock interview where you will be asked questions that pertain to a specific job description.  
Second enrollment students are expected to:
  1. Operate simple electronic transmission diagnostic equipment.
    - a. Complete a performance test using the scan tool and retrieve and interpret stored data.
    - b. Demonstrate the use of a multi-meter by testing the resistance of a shift solenoid.

2. Analyze failure codes and research repair documentation.  
Describe the failure code po137 for a 2001 GMC SONOMA. List the possible causes for this failure code.
3. Differentiate between reusable and defective parts.
  - a. Tear down a 4I60E transmission and list the defective parts.
  - b. Inspect pump A & pump B, which, if any, is reusable and which should be replaced and why?

Third enrollment students are expected to:

1. Operate complex electronic transmission diagnostic equipment.
  - a. Perform a diagnostic check using the Shaffer shifter and determine the possible cause for the malfunction.
  - b. Setup an automatic transmission on the dyno, perform a system check, and determine if the transmission is operating to factory specification.
2. Perform a major recondition with minimal assistance from instructor.
  - a. Teardown and recondition automatic transmission and install in-vehicle and verify proper operation.
  - b. Remove and replace automatic transmission according to factory specification.
3. Research rear wheel drive automatic transmission failures and upgrade transmission as needed.
  - a. What updates are available for the 4L65E automatic transmission?
  - b. What are some of the failures that commonly occur with a 4L60E transmission? What is the correction?

**VIII. TYPICAL TEXT(S):**

Jack Erjavec, Automatic Transmissions and Transaxles, 2<sup>nd</sup> Edition, Delmar/Thompson Learning, Albany, New York, 1999  
Chris Johanson and James E. Duffy, Automatic Transmission & Transaxles, Goodheart-Wilcox, Tinley Park, Illinois, 2002  
Tom Birch and Chuck Rockwood, Automatic Transmissions and Transaxles, 2<sup>nd</sup> Edition, Prentice Hall, Upper Saddle River, New Jersey, 2002  
Mark Hambaum, Automatic Transmissions and Transaxle Set and Shop Manual, Prentice Hall, Upper Saddle River, New Jersey, 2003

**IX. OTHER SUPPLIES REQUIRED OF STUDENTS:**

Safety glasses are to be worn at all times in lab area.