

J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: AUT 178

Credits: 4

Course Title: Automotive Final Drive and Manual Transmission Systems

Course Description: Presents the operation, design, construction, and repair of manual transmissions and final drive systems, for both front and rear drive vehicles including clutches, synchronizers, and torque multiplication/gear reduction, along with differentials, transmission/transaxles, drive axles, U-joints, CV joints, four-wheel drive, and all-wheel drive systems. Prerequisite: Completion of AUT 101 - Introduction to Automotive Systems is preferred. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

General Course Purpose: To examine automotive clutch systems, coupling devices, manual transmissions/transaxles, drive shafts, universal joints, four-wheel drive (4WD) and all-wheel drive (AWD) systems, and rear axle assemblies. Safety will be emphasized.

Course Prerequisites and Co-requisites:

Prerequisite: Completion of AUT 101 - Introduction to Automotive Systems is preferred.

Student Learning Outcomes:

Upon completing the course, the student will be able to

- a. Explain the operation of, and perform service on, both standard and limited slip differentials;
- b. Identify and perform service on both Cardin and constant velocity universal joints;
- c. Explain both the operation and service of clutch systems used with manual transmissions and transaxles;
- d. Explain the operation of manual transmissions and transaxles;
- e. Disassemble, inspect, repair, and reassemble manual transmissions and transaxles; and
- f. Use available service information to locate specifications related to the inspection, repair, and adjustments of manual transmissions and transaxles systems.

Major Topics to Be Included:

- a. Differentials
- b. Drive line service
- c. Clutch systems
- d. Manual transmissions - principles of operation, diagnosis, and service
- e. Manual transaxles - principles of operation, diagnosis, and service
- f. Final drive axle and CV joints
- g. Four-wheel drive systems operation, diagnosis, and service

Effective Date of Course Content Summary: March 29, 2018