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. 4 credits

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

- Explain the operation of, and perform service on, both standard and limited slip differentials;
- Identify and perform service on both Cardin and constant velocity universal joints;
- Explain both the operation and service of clutch systems used with manual transmissions and transaxles;
- Explain the operation of manual transmissions and transaxles;
- Disassemble, inspect, repair, and reassemble manual transmissions and transaxles; and
- 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:

- Differentials
- Drive line service
- Clutch systems
- Manual transmissions - principles of operation, diagnosis, and service
- Manual transaxles - principles of operation, diagnosis, and service
- Final drive axle and CV joints
- Four-wheel drive systems operation, diagnosis, and service

Effective Date/Updated: March 29, 2018