

**CUYAMACA COLLEGE**  
**COURSE OUTLINE OF RECORD**

**AUTOMOTIVE TECHNOLOGY 204 – ASEP–POWER TRAIN**

5 hours lecture, 6 hours laboratory, 7 units

**Catalog Description**

General Motors ASEP course to include an in-depth study of hydraulic power transmission and control systems used in automatic transmissions, including diagnosis and overhaul of actual transmissions to precise industry standards. Plus, theory of operation, diagnosis, repair and overhaul of manual transmissions, clutches, drivelines and differentials including four wheel drive and front wheel drive. Preparation for ASE and GM certification.

**Prerequisite**

None

**Course Content**

## 1) Lecture:

- a. Introduction and safety
- b. Purpose of clutch
- c. Types of clutches
- d. Pressure plate design
- e. Standard transmission principles
- f. Gear types
- g. Synchronizer types
- h. Gear ratios
- i. Types of linkage
- j. Electrical clutches
- k. Driveline types
- l. Rear drive differentials
- m. Front drive units
- n. Overdrive units
- o. Four wheel drive units
- p. Hydraulics theory and fluid flow in typical
- q. Torque converter operation including lock-up type
- r. Operation of drums, bands, servos, accumulators, clutches, modulators, governors
- s. Planetary gears: operation and control
- t. Shift control and valve bodies
- u. Coolers and fluid types
- v. Diagnosing automatic transmission problems
- w. Electronic transmission controls

## 2) Lab:

- a. Introduction and safety
- b. Laboratory procedures
- c. Equipment operation
- d. Transmission removal
- e. Transmission cleaning and disassembly
- f. Part inspection and failure diagnosis
- g. Valve body service

- h. Transmission reassembly and installation
- i. Clutch diagnosis and repair
- j. Overdrive repairs and shift linkage adjustment
- k. Driveline service (both front and rear drive cars)
- l. Oil seal replacement
- m. Wheel bearing diagnosis and replacement
- n. Ring and pinion gear replacement
- o. Differential repair (standard and Posi-Trac types)
- p. Diagnosis and repair of electronic transmission controls

### **Course Objectives**

Students will be able to:

- 1) Demonstrate standardized safety and hazardous waste handling practices.
- 2) Utilize manufacturer's repair data and specifications for accurate diagnosis and repair.
- 3) Diagnose manual and automatic transmission mechanical and electrical faults following manufacturer's procedures.
- 4) Utilize industry standards to perform maintenance and adjustment on automatic and manual transmissions.
- 5) Remove and replace drive train components and major assemblies according to published repair data.
- 6) Inspect, measure and replace torque converters and fluid couplings utilizing accepted industry practice.
- 7) Inspect, measure, repair and adjust drive train components and major assemblies following manufacturer's procedures.

### **Method of Evaluation**

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Quizzes, written exams, and hands-on performance exam that measure students' ability to safely identify necessary action or repair, diagnose and measure drive train components, and perform necessary tasks related to drive train repair.
- 2) Practical exercises that measure students' progress toward mastering tasks related to diagnosis, replacement, repair, testing and adjustment of drive train systems and components.
- 3) Skills-based summative assessment that measures students' ability to successfully complete the necessary NATEF tasks related to diagnosis, replacement, repair, testing and adjustment of drive train systems and components.

### **Special Materials Required of Student**

- 1) Mechanic's hand tool set
- 2) Approved safety glasses

### **Minimum Instructional Facilities**

- 1) Auto tech lab (6 bays)
- 2) Complete auto drive train equipment center
- 3) Various training models
- 4) Training vehicles
- 5) Smart classroom

### **Method of Instruction**

- 1) Lecture and demonstration
- 2) Individual assistance

**Out-of-Class Assignments**

- 1) Reading assignments
- 2) Writing assignments

**Texts and References**

- 1) Required: To be supplied by GM ASEP Curriculum Committee
- 2) Supplemental: None

**Student Learning Outcomes**

Upon successful completion of this course, students will be able to:

- 1) Demonstrate standardized safety and hazardous waste handling practices using assigned lab sheets and hands-on testing.
- 2) Utilize manufacturer's repair data and specifications for accurate diagnosis and repair of drive train related problems using assigned lab sheets and hands-on testing.