

**J. Sargeant Reynolds Community College  
Course Content Summary**

**Course Prefix and Number:** AUT 249      **Credits:** 5

**Course Title:** Advanced Automotive Electrical Diagnosis

**Course Description:**

Introduces advanced automotive electrical concepts, including theory and practical application. It provides instruction on diagnosing and repairing computer controlled modules, circuits, and systems. Covers advanced electronic principles, definitions of electronic terminology, computer networking, and how to use electronic test equipment. Provides preparation for the Automotive Service Excellence (ASE) A6 Electrical/Electronic Systems Certification examination. Lecture 2 hours. Laboratory 6 hours. Total 8 hours per week.

**General Course Purpose:**

This course provides instruction in advanced electrical diagnostic procedures. The focus will be on computer-controlled circuits along with electronics control unit (ECU) communication systems and diagnosis. Instruction will include, but is not limited to, advanced electrical systems such as airbags, immobilizers, and advanced driver assistance systems (ADAS).

**Course Prerequisites and Co-requisites:**

Prerequisites: AUT 149 and AUT 197

**Student Learning Outcomes:**

Upon completing the course, the student will be able to

- Develop diagnostic strategies for computers and computer-controlled functions
- Diagnose multiplex and other computer communication failures
- Assess and diagnose computer-controlled chassis electric system failures

**Major Topics to Be Included:**

- Computer Controls
- Analyze Analog and Digital Inputs Signals and Data
- Analyze Output Waveforms Command/Control Relationships
- Single-Wire Voltage Drive Network Theory, Construction, Function, and Diagnosis
- Two-Wire Differential Voltage Drive Network Theory, Construction, Function, and Diagnosis
- Supplemental Restraint and Occupant Classification Systems Calibration and Diagnosis
- Keyless Entry, Smart Key Access Programming and Diagnosis
- Immobilizers and Anti-Theft Systems Diagnosis
- Multimedia Systems Testing and Diagnosis
- ADAS Electrical Malfunction Diagnosis

**Effective Date/Updated:** January 19, 2023