

J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: AUT 149 **Credits:** 5

Course Title: Basic Automotive Electrical Diagnosis

Course Description:

Introduces basic automotive electrical concepts, including theory and practical application. Provides instruction on using circuit wiring diagrams to accurately diagnose, troubleshoot, and repair simple electric circuits. Covers basic electrical principles, electrical terminology, and how to use electrical testing 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 introductory instruction on electrical principles and applications. Initial instruction focuses on digital volt ohm meter (DVOM) usage and voltage drop testing with continued exposure to starting and charging systems. Students who successfully complete this course should be able to diagnostic procedures on non-computer-controlled electrical systems.

Course Prerequisites and Co-requisites:

Prerequisite: AUT 101

Student Learning Outcomes:

Upon completing the course, the student will be able to

- Predict voltage, current and resistance of non-computer-controlled circuits
- Differentiate and test simple circuits and individual components
- Interpret customer complaints related to a circuit fault.
- Apply a common diagnostic strategy to a non-computer controlled circuit.
- Demonstrate proper maintenance, service, and repair techniques of battery and other electrical components.
- Apply a common diagnostic strategy to a no-crank and/or a no-charge condition.
- Discriminate between computer inputs and outputs
- Develop and apply common diagnostic strategies for computer-controlled circuits.

Major Topics to Be Included:

- DVOM Basics and Usage
 - Measure volts/amps/ohms
 - Ohm's Law
- Series, Parallel and Series-Parallel Circuits
- Electrical Component Testing
- Electrical Wiring Diagrams
 - Diagram symbols
 - Current flow tracing
- Chassis Electrical Diagnostics

- Open circuit / high resistance testing using voltage drop measurements
 - Short circuit testing with continuity
 - Measuring for parasitic draw
- Battery Inspection, Testing, Maintenance and Service/Repair
 - Includes re-initialization of systems and/or battery reprogramming
- Starting Systems
 - Components, testing and diagnosis, and repair
 - Voltage and Current Testing
 - Introduction to Pico Scope (or other oscilloscope)
- Charging Systems
 - Components, testing and diagnosis, and repair
 - Voltage and Current Testing
- Introduction to Computers, Computer Controls, Communication

Effective Date/Updated: January 19, 2023