

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

Course Prefix and Number: AUT 245 **Credits:** 4

Course Title: Automotive Electronics

Course Description:

Introduces the field of electronics as it applies to the modern automobile. Emphasizes basic circuit operation, diagnosis, and repair of digital indicator and warning systems. Prerequisite: AUT 241. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

General Course Purpose:

To examine the basic theory, operation, diagnosis, and repair of automotive electronic systems. Safety will be emphasized.

Course Prerequisites and Co-requisites:

Prerequisite: AUT 241

Student Learning Outcomes:

Upon completing the course, the student will be able to

- Describe how semiconductors, diodes, and transistors work;
- Explain the principles of operation for common electronic circuits;
- Explain the principle of multiplexing;
- Describe the basic function of the central processing unit (CPU);
- List and describe the functions of the various sensors used by computers;
- Describe the principle of analog and digital signals;
- Explain the principle of computer communications;
- Summarize the function of a binary code;
- Name the various memory systems used in automotive microprocessors;
- List and describe the operation of output actuators;
- Identify the proper procedure to safeguard electronic systems;
- Describe the basic electronic logic circuits; and
- Explain how to use an oscilloscope for diagnosing electronic systems.

Major Topics to Be Included:

- Semiconductors
- Diodes and transistors
- Semiconductor circuits
- Sensors (feedback, Vref, NTC, PTC, etc.)
- Communication signals
- Logic gates (FET, NOT, NAND and NOR gates)
- Multiplexer and DE multiplexer
- Memories (ROM, PROM, EPROM, EEPROM, RAM, KAM, NVRAM)
- Actuators (output drivers, LCD, VFD)
- Power supplies
- Testing electronic circuits and systems (Ford, GM, Daimler Chrysler, and imports) (RMS, Frequency, Hertz)

Effective Date/Updated: June 3, 2019