Revised 03/2015

NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
AUT 245 - AUTOMOTIVEELECTRONICS (4 CR.)

Course Description

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

General Course Purpose

This course is a detailed study of electronic components and electronically controlled systems in the automobile. Particular emphasis is placed on how electronic devices are used in lighting systems, driver information systems, accessories, air bag systems, audio systems, climate control, engine and powertrain management, anti-lock brake systems, and stability control systems. The course is designed to provide the student with a basis for understanding sophisticated automotive electronics. Lecture demonstrations will cover theory, principles of operation, including diagnosis, repair, and failure analysis techniques using the latest electronic testing equipment.

Course Prerequisites/Corequisites

Prerequisite: AUT 242. The ability to read, write, and speak the English language.

Course Objectives

Upon completion of this course, the student should be able to:

- Explain the basic electronic circuits and components used in the automobile
- Demonstrate an understanding of electronic engine management systems, possible failures, troubleshooting procedures, and repair procedures
- Understand the theory and operation of electronic instrumentation, driver information, navigation, audio, communication, and other computer controlled systems
- Explain the operation of on board diagnostic computer systems, including, OBD II
- Demonstrate the efficient use of various diagnostic tools, including oscilloscopes, scan tools, DMM's, and other analyzers
- Describe the function, operation, and diagnosis of passive restraint and air bag systems
- Explain how electronic components function in electronic climate control systems
- Describe the theory and operation of electronic chassis control systems; to include anti-lock brakes, traction control, and stability control systems

Major Topics to be Included

- Electrical and electronic basics review, diagnosis and testing
- Computer controlled fuel injection and ignition systems
- Computer systems with body computer modules
- Electronically controlled transmissions
- Alert systems, including trouble codes, voice, communication and warning lights
- Communication, display and navigation systems
- Computer controlled anti-lock brake systems
- Computer controlled suspension systems
- Multiplex wiring systems and computer controlled technology
- Computer controlled emission systems
- Power train control modules and on board diagnostic computer systems
    - Passive restraint and air bag systems