AUT 233 - Hybrid Electric Vehicle Technology

Course Description

Effective: 2021-05-01

Presents technologies used in hybrid electrical vehicles (HEV), includes safety, theory, diagnosis, and component replacement. Covers automotive electronics; theory, operation and testing. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week. 4 credits

General Course Purpose

This course will introduce students to the technologies used in hybrid electric vehicles. The course will cover various HEV powertrain design platforms and the various modes of vehicle propulsion. Students will become familiar with HEV: safety, electric motors/generators, power inverter systems, battery technologies, braking systems and climate control systems.

Course Objectives

- Safely handle and service HEV high voltage systems
- Perform repairs to automotive electronically controlled systems.
- Identify and describe the different HEV powertrain systems and propulsion modes.
- Describe the theory and operation of HEV components.
- Diagnose and test HEV systems and related electronic systems.
- Remove and install HEV components; inverter assemblies and high voltage batteries.
- Explain the operating principles of HEV regenerative brake systems.
- Describe how a HEV air conditioning compressor operates.

Major Topics to be Included

- Electric vehicle and hybrid electric vehicle history
- High voltage safety systems and safety procedures
- Automotive electronics; theory, operation, diagnosis and testing
• Motor/generator theory and operation
• Inverter functions
• HEV transmission operation
• Battery construction and technologies
• HEV regenerative braking, modes and operation
• HEV climate control systems