

J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: AUT 230 Credits: 3

Course Title: Introduction to Alternative Fuels and Hybrid Vehicles

Course Description :

Introduces current trends in alternative fueled vehicles, including current alternative fueled vehicles and the implication and safety precautions necessary for working on hybrid vehicle systems. Lecture 3 hours per week. 3 credits

General Course Purpose:

To examine alternative fueled vehicle and hybrid electric vehicle systems. Safety will be emphasized.

- 9. Bio-Diesel
- 10. Hydrogen
- d. Batteries and Battery Service
 - 1. Introduction
 - 2. Battery Technology
 - 3. High-Voltage Battery in the Hybrid System
 - 4. Nickel-Metal Hydride Technology
 - 5. Auxiliary Battery in the Hybrid System
 - 6. Lead-Acid Technology
 - 7. Lithium-Ion Battery Technology
- e. Electric Motors, Generators, and Controls
 - 1. Fundamentals of Magnetism, Electromagnetism, and Electromagnetic Induction
 - 2. Electric Motors
 - 3. Brushless Motors
 - 4. Motor Control
 - 5. Capacitors in Hybrid Controllers
 - 6. Converters and Inverters
 - 7. Electric Power Steering
- f. Regenerative Braking Systems
 - 1. Principles of Regenerative Braking
 - 2. Regenerative Braking
 - 3. How the Regenerative Braking System Works
 - 4. Deceleration Rates
- g. Hybrid Vehicle Transmissions and Transaxles
 - 1. Manual versus Automatic
 - 2. Conventional Automatic Transmissions
 - 3. Continuously Variable Transmissions (CVT)
- h. Hybrid Vehicle Heating and Air Conditioning
 - 1. Hybrid ICE Cooling and Cabin Heating
 - 2. Hybrid Electrical System Cooling
 - 3. Hybrid Air-conditioning Systems

Effective Date/Updated: January 24, 2019