

Department:

Automotive Technology

Course Description:

This course is designed to give students an introduction of the various types of hybrid electric vehicles. Topic areas include improvement of fuel economy, hybrid designs, HEV components, and the operation of the typical hybrid electric vehicle.

Course Competencies:

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

1. Describe the major reasons for the development of electric and hybrid electric vehicles.
2. Describe the advantages and disadvantages of mild, medium and full hybrid vehicles.
3. Describe the four modes of operation of a typical hybrid vehicle.
4. Identify how fuel cell work and identify the various types of fuel cells.
5. Safely depower a hybrid electric vehicle.
6. Safely perform high-voltage disconnects.
7. Explain the unique service issues related to HEV high voltage systems.
8. Correctly use appropriate personal protective equipment.(PPE)
9. Explain hazards while drive, moving, and hoisting a hybrid electric vehicle.
10. Identify alternative energy sources

Course Content:

- A. Introduction to Hybrid Vehicles
 1. Background, driving and owning a hybrid vehicle
 2. Classifications of Hybrid Electric Vehicles
 3. Belt alternatives and starter systems
 4. Levels of Hybrid Vehicles
- B. Hybrid Electric Vehicle Safety Procedures
 1. High Voltage Safety Equipment
 2. First Responder Procedures
 3. Electric Shock Potential
 4. Vehicle Fire
 5. Preventing Current Flow
 6. Emergency Response
- C. Fuel Cells and Advanced Technologies
 1. Fuel Cell Technology
 2. "Pem" Fuel Cells
 3. Fuel Cell Vehicle Systems
 4. Hydraulic Hybrid Storage System
 5. HCCI
 6. Plug In Hybrid Electric Vehicles
 7. The Future for Electric Vehicles
 8. Wind Power

9. Hydroelectric Power

Learning Assessments:

Assessments may include: Quizzes, tests, project work, demonstrated competence, instructor observation, weekly assignments and/or written papers.

Instructional Materials:

Textbook: Halderman, J. (2020). *Automotive Technology: Principles, Diagnosis, and Service* (6th ed.). Pearson. ISBN-13: 978-0135257272

Lab Manual: Halderman, J. (2020). *ASE Correlated Task Sheets for Automotive Technology* (6th ed.). Pearson. ISBN-13: 978-0135257418

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the “Disabilities Self-Identification Form” on our [Disability Services website](#).

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an [online report](#) about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our [Equity Grievance Policy](#).