

SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: ATO-233 Class/Lect. Hours: 3 Lab Hours: 0 Credits: 3 Dept.: Automotive Technology
Course Title: Hybrid and Aternative Fueled Vehicles Semester: Fall Year: 2018

Course Description, Prerequisite, Corequisite: This classroom course will study the design features and equipment that today's alternative fuel vehicles are based on. The study of the drive, charging system and braking systems will be discussed. The topics of correct high voltage battery service and safety concerns will be covered in great detail. In addition to hybrids the class will cover fuel cell technology, plug in, and carbon based fuel operation. This overview course will cover Honda, Toyota, Ford and General Motor Hybrids.

Prerequisite: ATO-113, ATO-122

OBJECTIVES/COMPETENCIES

Course Objectives	Competencies
1. Understand the issues created by carbon fueled vehicles. 2. Describe the operation of hybrid engines.	1. Define what carbon based fuels are and how they affect the environment. 2. Explain what emission requirements are and how uncontrolled pollutants affect the environment. 1. Be able to discuss the mechanical differences between hybrids engines and normal internal combustion engines.

Course Objectives	Competencies
<p>3. Provide the student with a well rounded understanding of batteries.</p> <p>4. Describe how regenerative braking works in electric vehicles.</p> <p>5. Identify the design of hybrid transmissions and transaxels.</p> <p>6. Know the climate control components of a electric vehicle.</p> <p>7. Basic understanding of plug in vehicles.</p>	<ol style="list-style-type: none"> 1. Define the testing and precautions needed while handling all batteries. 2. Understand how to use a scan tool for the diagnosis of a faulty high voltage battery. 3. Know how to remove a high voltage battery using the correct protective gear and how to service the individual cells. <ol style="list-style-type: none"> 1. Understand the special characteristics of braking systems in hybrid/electric vehicles. 2. Explain how the ABS brake control in hybrids differs from standard vehicles. <ol style="list-style-type: none"> 1. The student will be able service the major components of a hybrid transmission. <ol style="list-style-type: none"> 1. Understand how to service the very unique climate control components of an electric drive vehicle. 2. Students will understand how to operate safely around the cooling system for the engine, passenger compartment and high voltage battery. <ol style="list-style-type: none"> 1. The student will be able to discuss battery range and charging levels.