Department:

Automotive Technology

Course Description:

This course is designed to give an introduction to how a diesel engine works. The course will focus on the difference between direct injection and indirect injection on diesel engine vehicles. Also covered will be the parts of a diesel engine fuel system, how glow plugs work, and how diesel fuel is rated and tested.

Course Competencies:

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

1. Explain the difference between direct injection and indirect injection.
2. Identify the three phases of diesel ignition.
3. Identify the two most commonly used types of automotive diesel injection systems.
4. Explain why glow plugs are kept working after the engine starts.
5. Explain the advantage of using diesel fuel with a high octane rating.
6. Identify how specific gravity of diesel fuel is tested.

Course Content:

A. Diesel Engine Operation and Diagnosis
   1. Indirect and direct injection
   2. Diesel fuel ignition
   3. Three phases of combustion
   4. Diesel engine construction
   5. Fuel tank and lift pump
   6. Injection pumps
   7. Hydraulic electronic unit injection system (HEUI)
   8. Diesel injector nozzles
   9. Glow plugs
B. Diesel Fuel
   1. Diesel fuel specific gravity testing
   2. Diesel fuel heaters
   3. Heated intake air
   4. Accelerator pedal position sensor
C. Diesel Particulate Filter (DPF)
   1. Exhaust gas temperature sensors
   2. DPF differential pressure sensor
D. Diesel Particulate Filter Regeneration (DPFR)
1. DPFR process
2. Types of DPFR

E. Condition of Running a DPFR Service
F. Scan Tool Diagnosis
   1. Compression testing
   2. Glow plug resistance balance test
   3. Injector pop testing
   4. Diesel emission testing

Learning Assessments:
Assessments may include quizzes, tests, projects, demonstrations of completed competencies, instructor observation, weekly assignments, and written papers.

Instructional Materials:
ISBN: 978-1-59070-618-9

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” at this link: https://highlandcc.edu/pages/disability-services.

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.