Department:

Automotive Technology

Course Description:

This course covers advanced engine diagnostics as well as engine removal, tear down, short block repair, and cylinder head repair. The course will also emphasize correct engine repair techniques.

Course Competencies:

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

1. Conduct performance tests and determine necessary action related to general engine diagnoses.
2. Replace timing belts and other components as required.
3. Remove and replace engines, both front-wheel and rear-wheel drive.
4. Remove cylinder heads.
5. Install cylinder heads.
6. Inspect and replace cams and related components.
7. Inspect and replace pans, covers, gaskets, and seals.
8. Disassemble, inspect, and clean short block assemblies.
9. Check and record short block measurements.
10. Check and record component measurements.
11. Deglaze cylinder walls and clean blocks properly.
12. Clean and prepare blocks and components for reassembly.
14. Complete engine assembly and pre-lube.
15. Start engines and set fuel and ignition systems to the manufacturer’s specifications.
16. Inspect and repair oil systems and components.
17. Perform cooling system tests and determine necessary action.
18. Inspect, replace, and adjust drive belts and hoses.
19. Replace cooling system components (thermostat, radiator, controllers).
20. Inspect coolant and drain, flush, and refill cooling systems with recommended coolant.
21. Perform oil and lube service on normally aspirated and turbocharged engines.

Course Content:

A. Gasoline Engine Operation and Diagnosis
B. Diesel Engine Operation and Diagnosis
C. Cooling System Operation and Diagnosis
D. Lubrication System Operation and Diagnosis  
E. Intake and Exhaust Systems  
F. Turbocharging and Supercharging  
G. Engine Condition Diagnosis  
H. Engine Disassembly, Cleaning, and Crack Detection  
I. Cylinder Heads and Valves  
J. Camshafts and Valve Trains  
K. Pistons, Rings, and Connecting Rods  
L. Engine Blocks, Crankshafts, and Bearings  
M. Engine Blueprinting and Assembly

Learning Assessments: 
Assessments may include quizzes, tests, project work, demonstrations, observations, weekly assignments, and written papers.

Instructional Materials:  

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.