

Department:

Auto Technology

Course Description:

In this course students will study and perform tasks from the National Automotive Technicians Education Foundation's (NATEF) Maintenance and Light Repair (MLR) Program. These studies include elements from general engine repair service, cylinder head and valve train diagnosis and repair, lubrication and cooling system service, and heating and A/C system service. After completion of this course, students will have a basic understanding of vehicle service requirements and safety procedures.

Course Competencies:

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

1. Check manual drive train fluid levels.
2. Identify tire condition, tread depth, size and application.
3. Rotate Tires/wheels and torque fasteners/wheel locks.
4. Check for poor stopping, pulling, dragging, noises, high or low pedal, and hard or spongy pedal.
5. Inspect brake hoses, brake lines, valves, and fittings for routing, leaks, dents, kinks, rust, cracks, or wear; inspect for loose fittings and supports; determine needed repairs.
6. Identify front and rear suspension system noises, handling, and ride height/quality concerns.
7. Inspect rear suspension system coil/air springs and spring insulators.
8. Check power steering fluid level; determine fluid type and adjust fluid level.
9. Inspect transmission for leaks; replace external seals and gaskets.
10. Select, handle, store, and install proper brake fluids.
11. The student will check fluid condition; check for leaks; determine necessary action.
12. The student will drain and refill manual transmission/transaxle and final drive unit.
13. The student will inspect, remove, and replace front wheel drive (FWD) bearings, hubs, and seals.
14. The student will inspect, service, and replace shafts, yokes, boots, and universal/CV joints.
15. Inspect, adjust, and replace transmission/transaxle external shifter assembly, shift linkages, brackets, bushings/grommets, pivots, and levers.
16. Retrieve and record diagnostic trouble codes.
17. Inspect, adjust, and repair all-wheel drive transfer case manual shifting mechanisms, bushings, mounts, levers and brackets.

Course Content:

- A. Engine Repair Service
 1. Research service information
 - a) Internal engine operation
 - b) Vehicle service history
 - c) Service precautions
 - d) Technical Service Bulletins (TSB)

2. Oil and filter service
 - a) Types of filters
 - b) Types of oil
- B. Transmission Service
 1. Fluid leaks
 - a) Seals
 - b) Gaskets
 - c) Bushings
 2. Checking fluid levels
 - a) Dip stick
 - b) Non dip stick
 3. Inspection and adjustment of external valve shift linkage
 - a) Range sensor/switch
 - b) Park/neutral position switch
 4. Drain and replace fluid and filters
 5. Power train mounts
- C. Manual Axle and Drive Train Service
 1. Fluids
 - a) Levels
 - b) Conditions
 - c) Types
 2. Leaks
 3. Drain and refill
 - a) Manual transmission/transaxle
 - b) Final drive unit
 - c) Four wheel drive components
 4. Clutch master cylinder fluid levels
 - a) Check for leaks
 - b) Design types
 5. Electronically controlled transmissions
 - a) Characteristics
 - b) Precautions
- D. Drive Shaft and Joint Service
 1. Drive shaft
 2. Half shaft
 3. Constant velocity
 4. Universal
 5. Bearing service
 6. Hubs G. Seals
 7. Yokes
- E. Brakes and Suspension
 1. Inspection
 2. Pad
 3. Brake Fluids
 4. Tires

Learning Assessments:

Competencies will be assessed by assignments, case problems, quizzes, tests, hands-on projects, instructor observations, and lab assignments. The test can be in the objective format or in a problem-solving format.

Instructional Materials:

Textbook: Halderman, J. (2015). *Automotive Technology: Principles, Diagnosis, and Service* (5th ed.). Pearson. ISBN-13: 978-0133994612

Lab Manual: Halderman, J. (2015). *NATEF Correlated Task Sheets for Automotive Technology* (5th ed.). Pearson. ISBN-13: 978-0133995671

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](#).