

**New Horizons Regional Education Center
Automotive Technology I Course Syllabus**

Mr. Young Instructor

dennis.young@nhrec.org

(757) 766-1100, EXT 3373

Office Hours

7:00 a.m.-7:15 a.m.

2:45 p.m.-3:00 p.m.

Course Description

Auto Technology I is the initial phase of a two-year program that prepares students to become entry-level auto technicians. It is articulated with Thomas Nelson Community College. Automotive manufacturers and local dealerships sponsor the Automotive Youth Education System at New Horizons. This program offers employment opportunities with dealerships for students who qualify and are selected during the spring semester of the first year. It also ensures that students have ASE certified instructors, service equipment, and current model cars so students receive quality instruction using the latest technology. Students who are selected for Summer Mentorship opportunities receive hands-on training in service departments of sponsoring dealers under the supervision of an experienced technician.

Required Textbook

Modern Automotive Technology, 7TH edition

James E. Duffy

Copyright 2009

Publisher: Goodheart-Wilcox

Course Fees

Student workbook \$19.00

Skill USA dues \$16.00

N3SA Test Fee \$15.00

Total: **\$50.00**

Materials for Class

Dickies dark blue button down shirt

Dickies dark blue pants (coveralls are **not** acceptable)

Black belt

One inch-3-ring binder

Oil resistant soled shoes (steel toe recommended)

One pair of safety glasses will be issued upon successful completion of the safety test

Evaluation of Student Performance/Grading

Nine week grading periods are based on the following:

Employability Skills – 40%

Related Instruction (Tests, quizzes, notebook, class work) – 30%

Competencies (hands-on, and workplace skill demonstration) – 30%

Two nine-week grading periods: 80% of semester grade

Mid term and final exams: 20% of semester grade

All procedures must be completed in accordance with NATEF standards.

General school rules and regulations

- A) Shop safety
- B) Employability skills
- C) Grading system

Hand and Power tools

- A) Identify common hand and power tools
- B) Demonstrate proper use of hand and power tools
- C) Identify safety concerns when using tools in the shop
- D) Demonstrate proper care and maintenance of tools

Electrical System Diagnosis (General)

- A) Check continuity in circuits using test light, voltmeter, oscilloscope, and wiring diagrams (D.1)
 - 1] parking brake indicator light system
 - 2] brake stop light system; adjust/service as needed
 - 3] wiring diagram usage during diagnosis
 - 4] test light usage to determine needed repairs
 - 5] inspection, testing and replacement circuit protection devices
- B) Check for shorts, opens, and grounds (D.2)
 - 1] check electrical circuits with test light; determine needed repair
 - 2] check electrical circuits using jumper wires; determine needed repair
 - 3] locate shorts, grounds, opens, and resistance problems; determine needed repair
 - 4] measure and diagnose cause of abnormal key-off battery drain; determine needed repair
- C) Measure resistance in electrical circuit using an ohmmeter (D.3)
 - 1] locate source of resistance problems.
 - 2] determine needed repair
- D) Measure voltage with a voltmeter or oscilloscope (D.4)
 - 1] check voltage in circuits using digital multimeter (DMM)
 - 2] check voltage drop in circuits using DMM
 - 3] determine needed repair
- E) Measure current with an ammeter
 - 1] check current flow in electrical circuits and components
 - 2] determine needed repairs

Lighting System Diagnosis and Repair

- A) Diagnose and repair electrical accessories (horn, wiper motor)
 - 1] diagnose incorrect horn operation; repairing as needed
 - 2] diagnose incorrect wiper operation; diagnose wiper speed control and park problems; repairing as needed
 - 3] diagnose incorrect windshield washer operation; repairing as needed
 - 4] diagnose incorrect operation of motor-driven accessory circuits
 - 5] diagnose incorrect heated glass operation; repairing as needed

Battery Diagnosis and Service

- A) Test battery condition

- 1] check with hydrometer
- 2] load test
- B) Service battery
 - 1] maintain or restore electronic memory functions
 - 2] inspect battery/carrier condition
 - 3] clean and refill battery
 - 4] slow and fast charge battery
- C) Replace battery
 - 1] carrier repair
 - 2] terminal repair/replace

Starting System Diagnosis and Repair

- A) Diagnose and determine needed repair
 - 1] starter draw and circuit voltage drop testing
 - 2] inspect/test/replace relays and solenoids
 - 3] bench test
- B) Remove/clean/disassemble/inspect starter motor and components
 - 1] disassemble and identify internal parts
 - 2] inspect/test internal parts
- C) Repair or replace starter motor

Charging System Diagnosis and Repair

- A) Diagnose needed repair on charging system
 - 1] troubleshoot undercharge, no charge, and overcharge conditions
 - 2] inspect/adjust/replace alternator drive belt
 - 3] inspect/test/replace voltage regulator
- B) Remove, clean, and inspect alternator
 - 1] remove, inspect, and replace/reinstall alternator
 - 2] disassemble, clean, inspect, and test alternator components; replacing as needed
- C) Repair or replace charging system components including inspection and testing voltage regulator; replacing as needed

Wheels and tires

- A) Identifying type and size of wheels and tires
- B) Identifying tire problems
- C) Mounting tires
- D) Balancing tires

Steering and suspension

- A) Types of suspension systems
 - 1] Coil type
 - 2] Leaf type
 - 3] Strut type
 - 4] Shock absorbers
 - 5] Maintenance and lubrication
- B) Steering
 - 1] Steering column
 - 2] Pump
 - 3] Rack and pinion
 - 4] Recirculating ball
- C) Alignment