

AUTOMOTIVE TECHNOLOGY I

5.0 Credits Grades 10-11-12

Pre-requisite: None

Course Outline

The student will study modern automotive technologies and the automotive industry, as well as receive instruction on that vast array of information available on the Internet regarding additional automotive technologies. Hands-on experiences enhance the learning situation for the student in the trouble-shooting practice sections. These sessions are designed to prepare the student with practical applications of math, science and technology learned in class. Students will be instructed how to properly maintain and repair their personal vehicles. A logical approach focused on patience and safety with both hand and power tools is strongly stressed.

- Module 1:
 - A. Shop Safety: "Safety is a State of Mind": hand tools, power tools, OSHA/DEP/EPA regulations, personal protective equipment
 - B. Internal Combustion Engine: 4-stroke engine operation/design, 2-stroke engine operation/design, hands-on lab assignments with small engines for disassembly and reassembly.
- Module 2:
 - A. Automotive Lubrication System: theory, parts, regular vs. synthetic oils, multi-viscosity vs. straight oils, maintenance, diagnostics and repairs, personal safety (PPE)
 - B. Automotive Braking System: theory, parts, drum brakes vs. disc brakes, brake fluid, brake bleeding, maintenance, diagnostics and repairs, diagnostics and repairs, personal safety (PPE)
- Module 3:
 - A. Automotive Cooling System: theory, parts, radiator design, engine coolant, maintenance, diagnostics and repairs, personal safety (PPE)
 - B. Automotive Ignition System: theory, parts, air/fuel mixtures, spark plugs, distributor vs. distributor-less ignition systems, coils, maintenance, diagnostics and repairs, diagnostics and repairs, personal safety (PPE)
- Module 4:
 - A. Automotive Wheels and Tires: theory, parts, wheel designs, tire designs, directional vs. non-directional tires, current trends, static vs high-speed balancing, maintenance, diagnostics and repairs, personal safety (PPE)
 - B. Automotive Alternative Fuels: theory, electric vehicles, hybrid vehicles, hydrogen fuel, natural gas fuel, Federal regulations/guidelines, Department of Transportation, current trends, maintenance, diagnostics and repairs, diagnostics and repairs, personal safety (PPE)

Learning Objective:

As students prepare for college and/or a career, they need to acquire the knowledge, skills, and attributes necessary to be a successful. This course will explore and help form the technical foundation in Automotive Technology with specific job skills for employment in the Automotive Industry and/or pursue additional technical education in a related postsecondary program. As they proceed through the course, they will demonstrate critical thinking and problem solving skills, learn to exercise sound reasoning in making complex choices regarding diagnostics and repairs, exhibit creative /innovative thinking reflective of STEM philosophies, and understand the attributes of physical safety and mental well-being by acting responsibly.

Grading Scale:

Assignments: (Classwork/Participation) 30%
Assessments: (Test/Projects/Quizzes) 60%
Quarterly: (end of Marking Period Exam) 10%
Total: 100%

Materials:

Texts: Modern Automotive Technology.

Duffy, James E.

8th Ed.

The Goodheart-Wilcox Company, Inc. U.S.A.

2014.

Modern Automotive Technology – Student Workbook

Duffy, James E.

8th Ed.

The Goodheart-Wilcox Company, Inc. U.S.A.

2014.

Tools: Various hand tools
Various power tools
Various pneumatic tools / tool sets

Equip: Challenger Industries 9000lb electric-pneumatic garage lift
Launch Corp 10000lb electric-pneumatic garage lift
Quality Industries 9000lb 4-post electric-pneumatic garage lift
Hoffman pneumatic tire machine
Hoffman electric high-speed wheel balancer
Craftsman 5hp gross torque engines