Maryland CTE Programs of Study

Automotive Basics (2025)

GENERAL REQUIREMENTS This course is recommended for students in Grades 9-12. 1

1 GENERAL REQUIREMENTS This course is recommended for students in Grades 9-12. 1

INTRODUCTION 2

A Career and Technical Education (CTE) instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions. 2.A

B The Supply Chain & Transportation Career Cluster focuses on planning, management, and movement of people, materials, and goods by road, pipeline, air, rail, and water and related professional support services such as transportation infrastructure planning and management, logistics services, mobile equipment, and facility maintenance. 2.B

C Automotive Basics includes knowledge of the basic automotive systems and the theory and principles of the components that make up each system and how to service these systems. Automotive Basics includes applicable safety and environmental rules and regulations. In Automotive Basics, students will gain knowledge and skills in the repair, maintenance, and servicing of vehicle systems. This study allows students to reinforce, apply, and transfer academic knowledge and skills to a variety of interesting and relevant activities, problems, and settings. The focus of this course is to teach safety, tool identification, proper tool use, and employability. 2.C

D Students will participate in at least two Career Exploration Work-Based Learning experiences in this course, which might include guest speakers and work-place tours relevant to the program of study. 2.D

E Students are encouraged to participate in extended learning experiences through aligned Career and Technical Student Organizations (CTSOs). CTSOs are a cocurricular requirement in the Carl D. Perkins Act, and alignment to CTSO activities is an expectation for CTE programs in the state of Maryland. 2.E

KNOWLEDGE AND SKILLS 3

A The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to: 3.A

Skip to main content

1. Demonstrate knowledge of the technical knowledge and skills related to health and safety in the workplace such as wearing safety glasses and other personal protective equipment (PPE) and maintaining safety data sheets (SDS). 3.A.1
2. Identify career and employment opportunities, including entrepreneurship opportunities, internships, and industry-recognized certification requirements for the field of automotive technology. 3.A.2
3. Demonstrate the principles of group participation, team concept, and leadership related to citizenship and career preparation. 3.A.3
4. Apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in the automotive technology industry. 3.A.4
5. Discuss certification opportunities. 3.A.5
6. Discuss response plans to emergency situations. 3.A.6
7. Identify employers' expectations and appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills. 3.A.7
8. Develop personal goals, objectives, and strategies as part of a plan for future career and educational opportunities. 3.A.8

B The student demonstrates appropriate personal and communication skills. The student is expected to: 3.B

1. Describe, demonstrate, and apply ethical and legal responsibilities for appropriate workplace conduct. 3.B.1
2. Demonstrate proper etiquette and behavior. 3.B.2
3. Demonstrate appropriate personal appearance and hygiene. 3.B.3
4. Demonstrate effective written and oral communication skills and employ effective listening skills. 3.B.4
5. Demonstrate advanced technical writing and preparation skills. 3.B.5
6. Demonstrate effective speaking skills through prepared and extemporaneous oral presentations. 3.B.6

C The student demonstrates academic skills related to the requirements of automotive technology. The student is expected to: 3.C

1. Demonstrate effective oral communication skills with individuals from various cultures such as fellow students, coworkers, and customers. 3.C.1
2. Demonstrate effective written communication skills, including documenting on a repair order the customer concern/complaint, root cause of the failure, and corrective action to complete the repair. 3.C.2
3. Demonstrate mathematical skills in performing addition, subtraction, multiplication, division, and measurements using decimals and fractions in the metric and U.S. standard systems as appropriate. 3.C.3

Skip to main content

The student understands the technical knowledge and skills of basic automotive systems. The student is expected to: 3.D

1 Describe the eight major vehicle systems. 3.D.1

2 Locate, read, and interpret vehicle maintenance and service information. 3.D.2

3 Describe the basic and emerging vehicle power systems. 3.D.3

E The student knows the functions and applications of the tools, equipment, technologies, and materials used in automotive services. The student is expected to: 3.E

1 Demonstrate the proper way to safely use hand and power tools and equipment commonly employed in the maintenance and repair of vehicles. 3.E.1

2 Discuss the proper handling and disposal of environmentally hazardous materials used in servicing vehicles. 3.E.2

3 Identify diagnostic tools and equipment. 3.E.3

4 Identify hand and shop tools and describe their proper usage. 3.E.4

Skip to main content

F **The student applies technical knowledge and skills in simulated or actual work situations. The student is expected to:** 3.F

1. Demonstrate the procedures for ordering and locating parts. 3.F.1
2. Demonstrate an understanding of the operation theory of internal combustion engines. 3.F.2
3. Identify brake system components, including drum, disc, power assist, and anti-lock braking system (ABS). 3.F.3
4. Demonstrate an understanding of basic concepts related to hydraulic brakes systems, including Pascal's Theory of Hydraulics. 3.F.4
5. Demonstrate an understanding of basic concepts related to electrical and electronic systems such as Ohm's law, voltage drop, resistance, amperage, voltage, and wiring diagram symbols. 3.F.5
6. Identify air-conditioning, heating, and accessory system components. 3.F.6
7. Inspect and identify chassis and power train components and systems. 3.F.7
8. Identify cooling and lubrication system components. 3.F.8
9. Identify steering and suspension components, including power steering. 3.F.9
10. Identify and interpret tire sidewall data information such as Department of Transportation (DOT) production date information, tire load capacity, inflation pressures, sizing description, and speed rating. 3.F.10
11. Compare the preventative maintenance schedules for a variety of vehicles based on their use. 3.F.11
12. Perform a preventative maintenance inspection. 3.F.12
13. Explain and perform a "jump-start" of a vehicle using jumper cables and a booster battery or an auxiliary power supply according to manufacturer recommended procedures. 3.F.13
14. Perform regular audits and inspections to maintain compliance with safety, health, and environmental regulations. 3.F.14

G **The student develops technology skills. The student is expected to:** 3.G

1. Use technology as a tool to research, organize, evaluate, and communicate information. 3.G.1
2. Use digital technologies (computers, PDAs, media players, GPSs, etc.); communication/ networking tools, and social networks appropriately to access, manage; integrate, evaluate, and create information to successfully function in a knowledge economy. 3.G.2
3. Demonstrate using current and new technologies specific to the program of study, course; and/or industry. 3.G.3
4. Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies. 3.G.4