Maryland CTE Programs of Study

Medium/Heavy Truck I (2025)

GENERAL REQUIREMENTS. This course is recommended for students in Grades 10-12. 1

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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 encompasses the transfer, coordination, and management of goods from production to consumption, ensuring efficient movement across various modes of transportation including air, ground, and water, as well as maintenance of the respective transport modes. This Cluster integrates logistics and distribution networks to facilitate the seamless flow of materials and products, playing a crucial role in global commerce, economic development, and community health. 2.B

C The Medium/Heavy Truck and Equipment Technician Program of Study is a comprehensive four-course sequence that prepares students for careers in diesel technology and heavy equipment maintenance. Throughout the program, students perform essential tasks such as testing electrical circuits, servicing brake systems, conducting engine diagnostics, and aligning steering components. The curriculum aligns with ASE Education Foundation standards, preparing students for ASE Entry-Level certification in Medium/Heavy Truck as well as other industry credentials such as EPA Section 609 MVAC certification. Graduates are prepared for entry-level positions as diesel technicians, fleet maintenance technicians, or heavy equipment service technicians. 2.C

D In Medium/Heavy Truck I, Students build on foundational skills to perform diagnosis and service of M/H truck electrical/ electronic systems and brake systems in accordance with ASE M/H Truck Test Specifications (Electrical/Electronic Systems, Brakes). Emphasis is placed on electrical theory, circuit diagnosis, battery/starting/charging systems, lighting, cab systems, air brakes, hydraulic brakes, and brake system safety. Students develop skills to prepare for ASE Entry-Level Electrical/Electronic Systems and Brakes certifications. 2.D

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Students will participate in at least two Career-Connected Education and Work-Based Learning experiences in this course, which might include informational

interviews or job shadowing relevant to the program of study. 2.E

F **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.F

KNOWLEDGE AND SKILLS 3

A **The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to:** 3.A

1. Identify and demonstrate positive work behaviors that enhance employability and job advancement, such as regular attendance, promptness, proper attire, maintenance of a clean and safe work environment, and pride in work. 3.A.1
2. Demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, active listening, and a willingness to learn. 3.A.2
3. Employ effective reading, writing, and technical documentation skills. 3.A.3
4. Solve problems using critical thinking techniques and structured troubleshooting methodologies. 3.A.4
5. Demonstrate leadership skills and collaborate effectively as a team member. 3.A.5
6. Implement safety procedures, including proper handling of hardware and following OSHA guidelines. 3.A.6
7. Exhibit an understanding of legal and ethical responsibilities in the Medium/Heavy Truck and Equipment field, following applicable laws and best practices for safety. 3.A.7
8. Demonstrate time-management skills and the ability to prioritize tasks in a technical setting. 3.A.8

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

1. Demonstrate respectful interaction with peers, instructors, and customers. 3.B.1
2. Apply active listening techniques to gather information accurately. 3.B.2
3. Prepare written documentation that is clear, concise, and professional. 3.B.3
4. Deliver verbal explanations of technical work to both technical and non-technical audiences. 3.B.4

C **The student demonstrates academic skills related to the requirements of maintaining and repairing medium/heavy trucks. The student is expected to:** 3.C

1. Apply mathematical calculations to measurement, torque, and basic circuit analysis. 3.C.1
2. Interpret tables, charts, and technical diagrams. 3.C.2
3. Read and follow technical service bulletins and manufacturer procedures. 3.C.3

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D **The student understands the technical knowledge and skills of automotive systems related to medium/heavy trucks. The student is expected to:** 3.D

1. Identify the major systems of a medium/heavy truck and describe their functions. 3.D.1
2. Explain the interaction between powertrain, brake, steering, and suspension systems. 3.D.2
3. Describe the role of preventive maintenance in vehicle reliability and safety. 3.D.3

E **The student applies the technical knowledge and skills of general electrical/electronic diagnosis (ASE T6-A). The student is expected to:** 3.E

1. Research service information, wiring diagrams, and TSBs. (ASE T6 A1, A5) 3.E.1
2. Analyze series, parallel, and series-parallel circuits using Ohm's Law. (ASE T6 A2) 3.E.2
3. Measure voltage, voltage drop, current, continuity, and resistance. (ASE T6 A3) 3.E.3
4. Identify and repair opens, shorts, and high resistance faults. (ASE T6 A4) 3.E.4

F **The student applies the technical knowledge and skills of battery systems (ASE T6-B). The student is expected to:** 3.F

1. Verify correct battery capacity for application. (ASE T6 B2) 3.F.1
2. Perform state-of-charge and load tests. (ASE T6 B4) 3.F.2
3. Inspect, clean, and service cables, connectors, and battery boxes. (ASE T6 B3–B9) 3.F.3

G **The student applies the technical knowledge and skills of starting systems (ASE T6-C). The student is expected to:** 3.G

1. Test starter cranking voltage and current draw. (ASE T6 C2, C5) 3.G.1
2. Inspect starter control circuit components. (ASE T6 C3) 3.G.2
3. Diagnose no-crank and slow-crank conditions. (ASE T6 C4) 3.G.3

H **The student applies the technical knowledge and skills of charging systems (ASE T6-D). The student is expected to:** 3.H

1. Test alternator output and AC ripple. (ASE T6 D5) 3.H.1
2. Perform voltage drop tests in charging circuits. (ASE T6 D6) 3.H.2
3. Inspect and service drive belts, pulleys, and tensioners. (ASE T6 D3) 3.H.3

I **The student applies the technical knowledge and skills of lighting systems (ASE T6-E). The student is expected to:** 3.I

1. Diagnose dim, intermittent, or non-functioning lights. (ASE T6 E1) 3.I.1

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Test and aim headlights. (ASE T6 E2) 3.I.2

Inspect tractor-to-trailer lighting connections. (ASE T6 E4) 3.I.3

J **The student applies the technical knowledge and skills of cab and chassis electrical systems (ASE T6-G). The student is expected to:** 3.J

1. Verify operation of wipers, horns, and mirrors. (ASE T6 G1) 3.J.1
2. Diagnose comfort/convenience systems such as power windows and locks. (ASE T6 G3) 3.J.2

K **The student applies the technical knowledge and skills of brake systems (ASE T4). The student is expected to:** 3.K

1. Identify and inspect air brake components: compressor, governor, dryer, tanks, valves. (ASE T4 A2) 3.K.1
2. Test for leaks, build-up time, and low-pressure warning. (ASE T4 A2-2) 3.K.2
3. Inspect and adjust slack adjusters; measure drum/rotor wear. (ASE T4 A3) 3.K.3
4. Inspect hydraulic brake components; bleed and flush systems. (ASE T4 B2–B3) 3.K.4
5. Diagnose ABS, ATC, and ESC system faults. (ASE T4 C1–C6) 3.K.5
6. Inspect, adjust, and replace parking brake components, including mechanical linkages and spring brakes. (ASE T4 A4) 3.K.6
7. Inspect, service, and replace foundation brake components such as brake shoes, drums, pads, rotors, calipers, and hardware. (ASE T4 A3, T4 B2) 3.K.7