Iowa CTE

# Automotive Technology

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| **Students understand the value and necessity of practicing personal and occupational safety and protecting the environment by using materials and processes in accordance with manufacturer and industry standards.** AUT1 | 1 **Know and understand common environmental conservation practices and their applications.** AUT1.1 |
| | 2 **Practice the safe handling and storage of chemicals and hazardous wastes in accordance with material safety data sheets and the requirements of local, state and federal regulatory agencies.** AUT1.2 |
| | 3 **Understand the way in which waste gasses, emissions and other environmentally destructive substances are generated and their effects on the environment.** AUT1.3 |
| | 4 **Evaluate the advantages and disadvantages of existing, new and emerging systems and the effects of those systems on the environment.** AUT1.4 |
| | 5 **Use appropriate personal protective equipment and safety practices.** AUT1.5 |
| **Students understand the safe and appropriate use of tools, equipment and work processes.** AUT2 | 1 **Understand and use appropriate tools and equipment, such as wrenches, sockets and pliers, to maintain and repair systems and components.** AUT2.1 |
| | 2 **Use tools, equipment and machines to safely measure, test, diagnose and analyze components and systems (e.g., electrical and electronic circuits, alternating-and direct-current applications, fluid/hydraulic and air/pneumatic systems).** AUT2.2 |
| | 3 **Select and use the appropriate measurement device(s) and use mathematical functions necessary to perform required fabrication, maintenance and operation procedures.** AUT2.3 |
| | 4 **Know and understand the elements of precision measuring using standard and metric systems.** AUT2.4 |
| | 5 **Use measurement scales, devices and systems, such as dial indicators, and micrometers to design, fabricate, diagnose, maintain and repair vehicles and components following appropriate industry standards.** AUT2.5 |
| | 6 **Know and understand how to access technical reports, manuals, electronic retrieval systems and related technical data resources.** AUT2.6 |
| | 7 **Comprehend the importance of calibration processes, systems and techniques using various measurement and testing devices.** AUT2.7 |

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| **Students understand scientific principles in relation to chemical, mechanical and physical functions for various engine and vehicle systems.** AUT3 | 1 **Understand the operating principles of internal and external combustion engines.** AUT3.1 |
| | 2 **Understand the function and principles of air conditioning and heating systems.** AUT3.2 |
| | 3 **Understand the basic principles of pneumatic and hydraulic power and their applications.** AUT3.3 |
| | 4 **Understand the applications of alternative power sources.** AUT3.4 |
| | 5 **Understand the principles of converting energy from one form to another.** AUT3.5 |
| | 6 **Perform necessary procedures to maintain, diagnose, service and repair vehicle systems and malfunctions.** AUT3.6 |
| **Students perform and document maintenance procedures in accordance with the recommendations of the manufacturer.** AUT4 | 1 **Understand the procedures and practices of various manufacturers regarding repair and maintenance schedules.** AUT4.1 |
| | 2 **Know how to properly document maintenance procedures in accordance with applicable rules, laws and regulations** AUT4.2 |
| | 3 **Use reference books, technical service bulletins and other documents and materials related to the automotive service industry available in print and through electronic retrieval systems to accurately diagnose and repair vehicles.** AUT4.3 |
| | 4 **Complete a work order, including customer information, description of repairs and billing information, in accordance with applicable rules, laws and regulations.** AUT4.4 |
| **Students understand the application, operation, maintenance and diagnosis of engines, including but not limited to two- and four-stroke and supporting subsystems.** AUT5 | 1 **Perform general engine maintenance, diagnosis, service and repair in accordance with national industry standards.** AUT5.1 |
| | 2 **Maintain, diagnose, service and repair ICE engine systems.** AUT5.2 |
| | 3 **Understand how to maintain, diagnose and repair computerized engine control systems and other engine-related systems.** AUT5.3 |
| | 4 **Maintain, diagnose, service and repair ignition, electronic and computerized engine controls and fuel management systems.** AUT5.4 |
| **Students understand the function, principles and operation of electrical and electronic sy[illegible] ma[illegible] inc[illegible]** | 1 **Understand how to maintain, diagnose and repair electrical systems.** AUT6.1 |
| | 2 **Maintain, diagnose, repair and service batteries.** AUT6.2 |
| | 3 **Understand how to maintain, diagnose, service and repair starting and charging [illegible]ystems** AUT6.3 |

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4 **Diagnose, service and repair lighting systems.** AUT6.4

5 **Diagnose, service and repair heating and air conditioning systems and components.** AUT6.5

6 **Diagnose, service and repair horns, wipers/washers and other accessories.** AUT6.6

7 **Perform necessary procedures to maintain, diagnose, service and repair vehicle electrical and electronic systems and malfunctions** AUT6.7

**Students understand the function and principles of automotive drivetrain, steering and suspension, brake and tire and wheel components and systems in accordance with national industry standards.** AUT7

1 **Understand how to maintain, diagnose, service and repair hydraulic and power assist systems.** AUT7.1

2 **Diagnose, service and repair disc brakes, drum brakes, anti-lock brakes and other brake systems as developed.** AUT7.2

3 **Diagnose, service and repair steering and suspension systems.** AUT7.3

4 **Understand the function and operation of automatic and manual transmissions and transaxles.** AUT7.4

5 **Maintain, service and repair tire and wheel assemblies.** AUT7.5

6 **Maintain, diagnose, service and repair under-vehicle systems and malfunctions.** AUT7.6