

## **Vermont Career Technical Education (CTE) Program Critical Proficiencies**

### **Automotive Technology, Diesel Technology, Auto Body Collision CTE Programs**

The Critical Proficiencies identify the essential knowledge, skills, and abilities that VT CTE students need to demonstrate (1) to be program completers, and (2) to be prepared for future learning. Critical proficiencies promote high expectations for all students, and support students' personal, professional, and academic development. At the high school level, VT's Proficiency-Based Graduation Requirements (PBGRs) reflect the critical proficiencies that lead to postsecondary career and college readiness.

For each of the unique program areas which categorize VT's CTE programs, the proficiency template includes:

- Program-Area Descriptions
- Career Ready Practices
- Career Cluster(s) and Pathway(s)
- Anchor Standards
- Program Technical Standards
- Academic Alignment
- CTE Program Elements

### **Advance CTE Common Career Technical Core - Career Ready Practices**

The Common Career Technical Core (CCTC) is a state-led initiative to establish a set of rigorous, high-quality standards for Career Technical Education (CTE). The CCTC includes a set of standards for each Career Cluster® and corresponding Career Pathways that define what students should know and be able to do after completing instruction in a program of study. The CCTC also includes an overarching set of Career Ready Practices that apply to all programs of study. The Career Ready Practices include statements that address the knowledge, skills, and dispositions that are important to becoming career ready.

The Career Ready Practices were developed from a state-led initiative sponsored by the National Association of State Directors of Career Technical Education Consortium (NASDCTEC).

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline, or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. (NASDCTEC, 2012)

## The Career Ready Practices

- are applicable across all program areas.
- align with the VT Transferable Skills Proficiency-Based Graduation Requirements (PBGRs) and VT Portrait of a Graduate.
- are the *transferable skills* of the Common Career Technical Core and the *portrait* of a VT CTE program completer.

## Advance CTE Common Career Technical Core - Career Cluster and Pathway Standards

The Common Career Technical Core is divided into Career Cluster and Pathway standards. Each Career Cluster contains one or more pathways with pathway-specific technical standards. The template shows which CCTC Career Cluster and Pathway standards are relevant to VT CTE programs.

## Anchor Standards

The Anchor Standards build upon the Career Ready Practices and show the overarching standards categories which are common across all technical programs within their Career Cluster(s) and Pathway(s). The VT CTE Anchor Standards are derived from and align with the CCTC Anchor Standards.

## Program Technical Standards

The Program Technical Standards build on and continue the Anchor Standards with more complexity, rigor, and career specificity. Knowledge and skills are learned and applied within a standards-based CTE program that integrates classroom, laboratory, and work-based instruction. The VT CTE Program Technical Standards are tailored to the unique characteristics and structure of each of the program areas.

## Academic Alignment

Each program-area template includes academic alignment with the VT Content-Area Sample Graduation Proficiencies as part of VT's Proficiency-Based Graduation Requirements (PBGRs). These include Common Core State Standards in English Language Arts and Mathematics, Next Generation Science Standards, as well as other adopted national and state academic standards.

## CTE Critical Proficiency Template

<b>Critical Proficiency Template:</b>	Attributes:
<b>Program-Area Descriptions</b>	For VT CTE Program Areas
<b>Common Career Technical Core - Career Ready</b>	1. Act as a responsible and contributing citizen and employee.

<b>Critical Proficiency Template:</b>	Attributes:
<b>Practices</b>	<ol style="list-style-type: none"> <li>2. Apply appropriate academic and technical skills.</li> <li>3. Attend to personal health and financial well-being.</li> <li>4. Communicate clearly and effectively and with reason.</li> <li>5. Consider the environmental, social, and economic impacts of decisions.</li> <li>6. Demonstrate creativity and innovation.</li> <li>7. Employ valid and reliable research strategies.</li> <li>8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>9. Model integrity, ethical leadership, and effective management.</li> <li>10. Plan education and career paths aligned to personal goals.</li> <li>11. Use technology to enhance productivity.</li> <li>12. Work productively in teams while using cultural global competence.</li> </ol>
<b>Common Career Technical Core - Career Cluster(s) and Pathway(s)</b>	Relevant to VT CTE Program Areas
<b>Anchor Standards</b>	<ol style="list-style-type: none"> <li>1. Academics</li> <li>2. Communication</li> <li>3. Problem Solving and Critical Thinking</li> <li>4. Technology</li> <li>5. Systems (Responsibility and Flexibility)</li> <li>6. Health and Safety</li> <li>7. Leadership and Teamwork</li> <li>8. Ethics and Legal Responsibilities</li> <li>9. Career Planning and Management</li> <li>10. Technical Knowledge and Skills (see Program Technical Standards)</li> <li>11. Demonstration and Application (see CTE Program Elements)</li> </ol>
<b>Program Technical Standards</b>	Build on the Anchor Standards with more complexity, rigor, and career specificity
<b>Academic Alignment</b>	With VT Content-Area Graduation Proficiencies

<b>Critical Proficiency Template:</b>	Attributes:
<b>CTE Program Elements</b>	Demonstration and application: <ul style="list-style-type: none"> <li>● Dual Enrollment/Fast Forward Courses</li> <li>● Industry Recognized Credentials (IRCs)</li> <li>● Work-Based Learning/Co-op/Apprenticeship</li> <li>● National Career Technical Student Organizations</li> <li>● Entrepreneurship</li> <li>● Portfolio/Personalized Learning Plan</li> </ul>

### **VT Automotive Technology, Diesel Technology, Auto Body Collision CTE Programs**

Students in **Automotive Technology** programs have in-depth, hands-on experiences in the operational and scientific nature of automotive component systems; safety, tools, and equipment; system diagnostics, inspection, and repair; customer service and business management.

Students in **Diesel Technology** programs have in-depth, hands-on experiences in safety, tools, and equipment; diesel system operating systems; diagnostics, service, and repair.

Students in **Auto Body Collision** programs have in-depth, hands-on experiences in repair, painting, and refinishing; damage analysis, estimating, and customer service; mechanical and electrical components; welding and fabrication.

The standards in this program area are designed to prepare students for further technical training, postsecondary education, and/or entry-level employment in the automotive and diesel industries, as well as other industries where a similar technical skill foundation is required. Students engage in an instructional program that integrates academic and technical preparation, career exploration, and preparation for postsecondary education and/or training. Knowledge and skills are learned and applied within a standards-based CTE program that integrates classroom, laboratory, and work-based instruction.

## Advance CTE Common Career Technical Core - Career Ready Practices

<p><b>Advance CTE Common Career Technical Core - Career Ready Practices:</b></p>	<p>Aligned with <a href="#">VT Transferable Skills</a> Proficiency-Based Graduation Requirements (PBGRs) and <a href="#">VT Portrait of a Graduate</a></p>
<p><b>1. Act as a responsible and contributing citizen and employee.</b></p>	<p>Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community, and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.</p>
<p><b>2. Apply appropriate academic and technical skills.</b></p>	<p>Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.</p>
<p><b>3. Attend to personal health and financial well-being.</b></p>	<p>Career-ready individuals understand the relationship between personal health, workplace performance, and personal well-being; they act on that understanding to regularly practice healthy diet, exercise, and mental health activities. Career-ready individuals also take regular action to contribute to their personal financial wellbeing, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.</p>
<p><b>4. Communicate clearly and effectively and with reason.</b></p>	<p>Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.</p>

<p><b>Advance CTE Common Career Technical Core - Career Ready Practices:</b></p>	<p>Aligned with <a href="#">VT Transferable Skills</a> Proficiency-Based Graduation Requirements (PBGRs) and <a href="#">VT Portrait of a Graduate</a></p>
<p><b>5. Consider the environmental, social, and economic impacts of decisions.</b></p>	<p>Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment, and the profitability of the organization.</p>
<p><b>6. Demonstrate creativity and innovation.</b></p>	<p>Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.</p>
<p><b>7. Employ valid and reliable research strategies.</b></p>	<p>Career-ready individuals are discerning in accepting and using new information to make decisions, change practices, or inform strategies. They use reliable research processes to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.</p>
<p><b>8. Utilize critical thinking to make sense of problems and persevere in solving them.</b></p>	<p>Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.</p>
<p><b>9. Model integrity, ethical leadership, and effective management.</b></p>	<p>Career-ready individuals consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety</p>

<p><b>Advance CTE Common Career Technical Core - <a href="#">Career Ready Practices</a>:</b></p>	<p>Aligned with <a href="#">VT Transferable Skills</a> Proficiency-Based Graduation Requirements (PBGRs) and <a href="#">VT Portrait of a Graduate</a></p>
	<p>of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others' actions, attitudes, and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals, and organizational culture.</p>
<p><b>10. Plan education and career paths aligned to personal goals.</b></p>	<p>Career-ready individuals take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience, and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.</p>
<p><b>11. Use technology to enhance productivity.</b></p>	<p>Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks - personal and organizational - of technology applications, and they take actions to prevent or mitigate these risks.</p>
<p><b>12. Work productively in teams while using cultural global competence.</b></p>	<p>Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural differences to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.</p>

**Advance CTE Common Career Technical Core - [Transportation, Distribution, and Logistics](#) Career Cluster and Pathway Standards**

<p><b>The following Career Cluster and Pathway standards are relevant to VT Automotive Technology, Diesel Technology, Auto Body Collision CTE programs:</b></p>	<p>This Career Cluster® is focused 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. (The CCTC Career Cluster and Pathway is a broader subset of the transportation area; the VT Automotive program-areas are a small facet of the TD &amp; L Career Cluster.)</p>
<p><b>Transportation, Distribution, and Logistics Career Cluster</b></p>	<ol style="list-style-type: none"> <li>1. Describe the nature and scope of the Transportation, Distribution &amp; Logistics Career Cluster and the role of transportation, distribution and logistics in society and the economy.</li> <li>2. Describe the application and use of new and emerging advanced techniques to provide solutions for transportation, distribution, and logistics problems.</li> <li>3. Describe the key operational activities required of successful transportation, distribution, and logistics facilities.</li> <li>4. Identify governmental policies and procedures for transportation, distribution, and logistics facilities.</li> <li>5. Describe transportation, distribution, and logistics employee rights and responsibilities and employers' obligations concerning occupational safety and health.</li> <li>6. Describe career opportunities and means to achieve those opportunities in each of the Transportation, Distribution, Logistics Career Pathways.</li> </ol>
<p><b>Facilities and Mobile Equipment Maintenance Pathway</b></p>	<ol style="list-style-type: none"> <li>1. Develop preventative maintenance plans and systems to keep facility and mobile equipment inventory in operation.</li> <li>2. Design ways to improve facility and equipment system performance.</li> </ol>

**VT CTE Program Anchor Standards**

<p><b>Anchor Standards:</b></p>	<p>Aligned with Advance CTE Common Career Technical Core - Career Cluster Anchor Standards</p>
<p><b>1. Academics</b></p>	<p>Achieve additional academic knowledge and skills required to pursue the full-range of career and postsecondary education opportunities.</p>



<b>Anchor Standards:</b>	Aligned with Advance CTE Common Career Technical Core - Career Cluster Anchor Standards
<b>2. Communication</b>	Acquire and accurately use terminology and information at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.
<b>3. Problem Solving and Critical Thinking</b>	Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem using critical and creative thinking; logical reasoning, analysis, inquiry, and problem-solving techniques.
<b>4. Technology</b>	Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the workplace environment.
<b>5. Systems</b> (Responsibility and Flexibility)	Initiate, and participate in, a range of collaborations to demonstrate behaviors that reflect personal and professional responsibility, flexibility, and respect in the workplace environment and community settings.
<b>6. Health and Safety</b>	Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the workplace environment.
<b>7. Leadership and Teamwork</b>	Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution.
<b>8. Ethics and Legal Responsibilities</b>	Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms.
<b>9. Career Planning and Management</b>	Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.
<b>10. Technical Knowledge and Skills</b> (see Program Technical Standards)	Apply essential technical knowledge and skills common to the Career Cluster and Pathway(s), following procedures when carrying out experiments and/or performing technical tasks.
<b>11. Demonstration and Application</b>	Demonstrate and apply technical knowledge and skills across a variety of CTE-specific opportunities in classroom,

<b>Anchor Standards:</b>	Aligned with Advance CTE Common Career Technical Core - Career Cluster Anchor Standards
(see CTE Program Elements)	laboratory, and workplace settings.

### VT Automotive Technology CTE Program Technical Standards

<b>Program Technical Standards:</b> Aligned with ASE Automobile Program Standards	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>1. Safety Precautions, Work Habits, and Ethics</b>	<ul style="list-style-type: none"> <li>a. Identify and explain laws and workplace policies.</li> <li>b. Describe personal and environmental safety practices associated with clothing and proper Personal Protection Equipment (PPE); hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.</li> <li>c. Identify vehicle system precautions and/or inspections to include but not limited to Supplemental Restraint System (SRS) Inspection, Advanced Driver Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles, locations and recommended procedures before inspecting or replacing components.</li> </ul>
<b>2. Tools and Equipment</b>	<ul style="list-style-type: none"> <li>a. Identify vehicle construction and parts.</li> <li>b. Identify and utilize appropriate tools, materials, and equipment.</li> <li>c. Demonstrate proper use of precision measuring tools.</li> </ul>
<b>3. Automotive Technology Math</b>	<ul style="list-style-type: none"> <li>a. Identify and apply standard and metric measurements.</li> <li>b. Apply mathematical concepts and operations to automotive technology (i.e., convert decimals to fractions, identify alignment angles).</li> </ul>
<b>4. Automotive Technology Science</b>	<ul style="list-style-type: none"> <li>a. Apply scientific concepts to automotive technology.</li> <li>b. Connect basic electricity concepts to explain the relationship between voltage, current, resistance, and circuits.</li> <li>c. Relate physics concepts to describe fluid viscosity as it applies to engine performance.</li> </ul>

<p><b>Program Technical Standards:</b> Aligned with ASE Automobile Program Standards</p>	<p>Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.</p>
<p><b>5. Engine Performance and Repair</b></p>	<ul style="list-style-type: none"> <li>a. Identify engine components and parts and explain their functions.</li> <li>b. Evaluate general engine performance and apply tests to vehicle specifications.</li> <li>c. Identify the components of an automatic transmission system.</li> <li>d. Demonstrate general engine service techniques.</li> <li>e. Summarize lubrication and cooling systems service and repair.</li> <li>f. Explain general transmission/transaxle service.</li> <li>g. Explain in-vehicle transmission/transaxle service and repair.</li> <li>h. Investigate characteristics of off-vehicle transmission/transaxle service and repair.</li> <li>i. Interpret computerized engine controls.</li> <li>j. Describe fuel, air induction, and exhaust systems service and repair.</li> <li>k. Identify emissions control systems service and repair.</li> </ul>
<p><b>6. Drive Train/Axle</b></p>	<ul style="list-style-type: none"> <li>a. Explain general drivetrain and drive axle service and repair.</li> <li>b. Investigate clutch systems for service and repair.</li> <li>c. Identify the transmission/transaxle components. Explain drive shaft and half shaft, universal, and constant velocity(cv) joint service and repair.</li> <li>d. Assess differential case assembly for service.</li> <li>e. Assess four-wheel drive/all-wheel drive components for service and repair.</li> </ul>
<p><b>7. Steering and Suspension</b></p>	<ul style="list-style-type: none"> <li>a. Explain basic diagnostic and repair services on wheels and tires.</li> <li>b. Identify steering and suspension system components and parts, and explain their functions.</li> <li>c. Explain how to diagnose and repair steering and suspension system components.</li> <li>d. Prepare vehicle for general suspension and steering systems service.</li> <li>e. Investigate wheel alignment conditions.</li> </ul>

<p><b>Program Technical Standards:</b> Aligned with ASE Automobile Program Standards</p>	<p>Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.</p>
<p><b>8. Brake System</b></p>	<ul style="list-style-type: none"> <li>a. Identify disc and drum brake system components and parts, and explain their functions.</li> <li>b. Describe how to diagnose and repair brake system components.</li> <li>c. Explain hydraulic system service and repair.</li> <li>d. Explain drum brake service and repair.</li> <li>e. Explain disc brake service and repair.</li> <li>f. Identify power assist units.</li> <li>g. Assess miscellaneous service and repair (wheel bearings, parking brakes, electrical, etc.).</li> <li>h. Evaluate electronic brake, traction, and stability control systems.</li> </ul>
<p><b>9. Electrical</b></p>	<ul style="list-style-type: none"> <li>a. Describe general electronic systems service.</li> <li>b. Explain battery service.</li> <li>c. Explain starting system service and repair.</li> <li>d. Explain charging system service and repair.</li> <li>e. Explain lighting systems service and repair.</li> <li>f. Describe accessories service and repair.</li> </ul>
<p><b>10. Heating, Ventilation, Air Conditioning</b></p>	<ul style="list-style-type: none"> <li>a. Explain a/c systems.</li> <li>b. Identify and inspect refrigeration system components.</li> <li>c. Identify and inspect heating, ventilation, and engine cooling systems.</li> <li>d. Identify and inspect operating systems and related controls.</li> </ul>
<p><b>11. Service and Business Management</b></p>	<ul style="list-style-type: none"> <li>a. Prepare a vehicle for service by researching vehicle service information, precautions, and technical service bulletin.</li> <li>b. Summarize and demonstrate a multi-point vehicle inspection.</li> <li>c. Develop and demonstrate customer service and sales skills.</li> <li>d. Evaluate how to calculate costs associated with service transactions (i.e., parts, sales, and labor).</li> </ul>
<p><b>12. Communication</b></p>	<ul style="list-style-type: none"> <li>a. Demonstrate effective verbal and written communication skills in the automotive technology classroom, shop, and work site.</li> </ul>

<b>Program Technical Standards:</b> Aligned with ASE Automobile Program Standards	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>13. Leadership and Teamwork</b>	a. Demonstrate an ability to work independently and as a collaborative team member in the field of automotive technology.
<b>14. Career Development</b>	a. Identify and explore automotive technology career options and pathways, and research required training and certification processes.

### VT Diesel Technology CTE Program Technical Standards

<b>Program Technical Standards:</b> Aligned with ASE Medium/Heavy Truck Program Standards	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>1. Safety Precautions, Work Habits, and Ethics</b>	<ul style="list-style-type: none"> <li>a. Identify and explain laws and workplace policies</li> <li>b. Describe personal and environmental safety practices associated with clothing and proper Personal Protection Equipment (PPE); hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.</li> <li>c. Identify vehicle system precautions and/or inspections to include but not limited to Supplemental Restraint System (SRS) Inspection, Advanced Driver Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles, locations, and recommended procedures before inspecting or replacing components.</li> </ul>
<b>2. Tools and Equipment</b>	<ul style="list-style-type: none"> <li>a. Identify vehicle construction and parts.</li> <li>b. Identify and utilize appropriate tools, materials, and equipment.</li> </ul>
<b>3. Diesel Technology Math</b>	<ul style="list-style-type: none"> <li>a. Identify standard and metric measurements.</li> <li>b. Relate mathematical concepts and operations to diesel technology (i.e., convert decimals to fractions, identify alignment angles).</li> </ul>

<p><b>Program Technical Standards:</b> Aligned with ASE Medium/Heavy Truck Program Standards</p>	<p>Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.</p>
<p><b>4. Diesel Engine Service</b></p>	<ul style="list-style-type: none"> <li>a. Prepare a vehicle for service by researching vehicle service information and precautions.</li> <li>b. Explain preliminary engine inspection.</li> <li>c. Explain cylinder head and valve train service.</li> <li>d. Explain engine block service and repair.</li> <li>e. Explain lubrication systems service and repair.</li> <li>f. Explain cooling systems service and repair.</li> <li>g. Inspect air induction and exhaust systems.</li> </ul>
<p><b>5. Preventative Maintenance Inspections</b></p>	<ul style="list-style-type: none"> <li>a. Assess engine systems for service.</li> <li>b. Investigate fuel systems for service.</li> <li>c. Assess air induction and exhaust systems for service.</li> <li>d. Investigate cooling systems for service.</li> <li>e. Analyze lubrication systems for service.</li> <li>f. Investigate cab and hood instruments and controls for serviceability.</li> <li>g. Assess cab and hood safety equipment for service.</li> <li>h. Inspect cab and hood hardware/accessories for service.</li> <li>i. Examine heating, ventilation &amp; air conditioning (hvac) systems for service.</li> <li>j. Assess battery and starting systems.</li> <li>k. Assess charging systems.</li> <li>l. Investigate lighting systems for service.</li> <li>m. Examine air brakes for service.</li> <li>n. Investigate hydraulic brakes for service.</li> <li>o. Investigate suspension and steering systems for service.</li> <li>p. Assess tires and wheels for service.</li> </ul>
<p><b>6. Communication</b></p>	<ul style="list-style-type: none"> <li>a. Demonstrate effective verbal and written communication skills in the classroom, shop, and workplace.</li> </ul>
<p><b>7. Leadership and Teamwork</b></p>	<ul style="list-style-type: none"> <li>a. Demonstrate an ability to work independently and as a collaborative team member in the field of diesel technology.</li> </ul>
<p><b>8. Career Development</b></p>	<ul style="list-style-type: none"> <li>a. Identify and explore diesel technology career options and pathways, and research required training and certification processes.</li> </ul>

## VT Auto Body Collision CTE Program Technical Standards

<p><b>Program Technical Standards:</b> ASE Collision Repair and Refinish Program Standards</p>	<p>Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.</p>
<p><b>1. Safety Precautions, Work Habits, and Ethics</b></p>	<ul style="list-style-type: none"> <li>a. Identify and explain laws and workplace policies.</li> <li>b. Describe personal and environmental safety practices associated with clothing and proper Personal Protection Equipment (PPE); hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.</li> <li>c. Identify vehicle system precautions and/or inspections to include but not limited to Supplemental Restraint System (SRS) Inspection, Advanced Driver Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles, locations, and recommended procedures before inspecting or replacing components.</li> </ul>
<p><b>2. Damage Analysis, Estimating, and Customer Service Skills</b></p>	<ul style="list-style-type: none"> <li>a. Perform damage analysis.</li> <li>b. Demonstrate estimating procedures; read and analyze estimates.</li> <li>c. Identify vehicle construction and parts.</li> <li>d. Identify and utilize appropriate tools and equipment.</li> <li>e. Demonstrate customer relations and sales skills.</li> </ul>
<p><b>3. Painting and Refinishing</b></p>	<ul style="list-style-type: none"> <li>a. Utilize surface preparation techniques.</li> <li>b. Perform spray gun and related equipment operations.</li> <li>c. Utilize paint mixing, matching, and application techniques.</li> <li>d. Identify paint defects, and their causes and cures.</li> <li>e. Perform reconditioning and final detail procedures.</li> </ul>
<p><b>4. Non-Structural Analysis and Damage Repair</b></p>	<ul style="list-style-type: none"> <li>a. Demonstrate inspection and preparation techniques.</li> <li>b. Perform outer body panel repairs, replacements, and adjustments.</li> <li>c. Apply metal finishing and body filling techniques.</li> <li>d. Identify types of plastics, utilize adhesives, and perform repairs.</li> </ul>

<b>Program Technical Standards:</b> ASE Collision Repair and Refinish Program Standards	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>5. Welding, Cutting, and Joining</b>	a. Perform metal welding, cutting, and joining techniques.
<b>6. Mechanical and Electrical Components</b>	a. Identify suspension, steering, and brake components and alignment angles. b. Identify, inspect, repair, and replace electrical system components. c. Identify and inspect coolant system components. d. Identify drive train components. e. Identify and describe fuel, intake, and exhaust system components. f. Identify and inspect restraint system components.
<b>7. Communication</b>	a. Demonstrate effective verbal and written communication skills in the auto body collision classroom, shop, and work site.
<b>8. Leadership and Teamwork</b>	a. Demonstrate an ability to work independently and as a collaborative team member in the auto body collision industry.
<b>9. Career Development</b>	a. Identify and explore auto body collision career options and pathways, and research required training and certification processes.

**VT Automotive Technology, Diesel, Technology, Auto Body Collision CTE Program - Academic Alignment with [VT Content Area Graduation Proficiencies \(PBGRs\)](#)**

<b>Graduation Proficiencies:</b>	<b>Indicators:</b>
<a href="#">English Language Arts</a>	High School 1. <b>Reading:</b> b, c, d, g 2. <b>Writing:</b> a, b, e 3. <b>Writing:</b> c 4. <b>Speaking and Listening:</b> a, b, d 5. <b>Speaking and Listening:</b> a, b, d 6. <b>Language:</b> a, c, e
<a href="#">Mathematics</a>	High School 1. <b>Modeling:</b> a, b, c, e, f 2. <b>Number and Quantity:</b> c 3. <b>Algebra:</b> g, h



<b>Graduation Proficiencies:</b>	<b>Indicators:</b>
	5. <b>Geometry:</b> m, n 6. <b>Statistics and Probability:</b> a, e
<a href="#">Science</a>	High School 1. <b>Physical Sciences:</b> Structure/Properties of Matter, Forces, and Interactions: e, k 2. <b>Physical Sciences:</b> Energy, Waves, and Electromagnetic Radiation: c, d 8. <b>Engineering, Technology, and Application of Science:</b> e, i
<a href="#">Global Citizenship/Social Studies</a>	End of Gr. 12 <b>Inquiry:</b> Constructing compelling and supporting questions: a, d; Determining helpful sources: a <b>Civics:</b> Processes, Rules, and Laws: a <b>Economics:</b> Economic Decision Making: a; Exchange and Markets: a <b>Geography:</b> Human Environment Interaction: Place, Regions, and Culture: a <b>Communicating Conclusions and Taking Informed Action:</b> Communicating: b

### VT Automotive Technology, Diesel, Technology, Auto Body Collision CTE Program Elements

<b>Demonstration and Application:</b>	Available Options:
<b>Dual Enrollment/Fast Forward Courses</b>	<ul style="list-style-type: none"> <li>● <b>VTC:</b> Suspension &amp; Steering I (ATT 1011), Suspension &amp; Steering II (ATT 1012), Alignment &amp; Brakes I (ATT 1051), Alignment &amp; Brakes II (ATT 1052), Auto Vehicle Electronics (GTS 1120/ATT 1090)</li> <li>● <b>CCV:</b> Intro to Business (BUS-1010-VC50), Startup 802: An Entrepreneurial Mindset (BUS-1125-VC50)</li> </ul>
<b>Industry Recognized Credentials (IRCs)</b>	<b>Tier 1:</b> <ul style="list-style-type: none"> <li>● Automotive Lift Institute (ALI) - Lifting It Right</li> <li>● Automotive Service Excellence (ASE) - Introduction to Automobile Service E-Learning Program</li> <li>● S/P2 - Automotive Service</li> <li>● S/P2 - Collision Repair</li> </ul>

<b>Demonstration and Application:</b>	Available Options:
	<ul style="list-style-type: none"> <li>● S/P2 - Heavy-Duty/Diesel</li> <li>● Vermont Department of Motor Vehicles - Commercial Driver's License Permit</li> </ul> <p><b>Tier 2:</b></p> <ul style="list-style-type: none"> <li>● Automotive Oil Change Association (AOCA) Certified Lube Technician</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Automobile Service Technology</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Automatic Transmission/Transaxle</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Brakes</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Medium/Heavy Truck - Diesel Engines</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Electrical/Electronic Systems</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Engine Performance</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Engine Repair</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Heating and Air Conditioning</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Manual Drive Train and Axles</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Mechanical and Electrical</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Maintenance and Light Repair</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Non-structural Analysis &amp; Damage Repair</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Painting and Refinishing</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Structural Analysis &amp; Damage Repair</li> </ul>

<b>Demonstration and Application:</b>	Available Options:
	<ul style="list-style-type: none"> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Suspension and Steering</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Medium/Heavy Truck - Brakes</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Medium/Heavy Truck Suspension &amp; Steering</li> <li>● Automotive Service Excellence (ASE) Entry Level Certification - Medium/Heavy Truck - Inspection Maintenance &amp; Minor Repair</li> <li>● Tire Industry Association - Tire Service Training and Certification</li> <li>● Vermont Agency of Transportation/Department of Motor Vehicles - Vermont State Inspection Certification</li> <li>● ACT National Career Readiness Certificate - Levels 5, 6, or 7</li> </ul>
<b>National Career Technical Student Organizations (CTSOs)</b>	SkillsUSA
<b>Work-Based Learning/Co-op (WBL)</b>	Varies by CTE Center
<b>Entrepreneurship Opportunities</b>	Varies by CTE Center
<b>Portfolio/Personalized Learning Plan (PLP)</b>	Varies by CTE Center