Vermont Career Technical Education (CTE) Program Critical Proficiencies

Information Technology 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

Critical Proficiency Template:	Attributes:
Program-Area Descriptions	For VT CTE Program Areas
Common Career Technical Core - Career Ready Practices	1. Act as a responsible and contributing citizen and employee. 2. Apply appropriate academic and technical skills. 3. Attend to personal health and financial well-being. 4. Communicate clearly and effectively and with reason. 5. Consider the environmental, social, and economic impacts of decisions. 6. Demonstrate creativity and innovation. 7. Employ valid and reliable research strategies. 8. Utilize critical thinking to make sense of problems and persevere in solving them. 9. Model integrity, ethical leadership, and effective management. 10. Plan education and career paths aligned to personal goals. 11. Use technology to enhance productivity. 12. Work productively in teams while using cultural global competence.
Common Career Technical Core - Career Cluster(s) and Pathway(s)	Relevant to VT CTE Program Areas
Anchor Standards	1. Academics 2. Communication 3. Problem Solving and Critical Thinking 4. Technology 5. Systems (Responsibility and Flexibility) 6. Health and Safety 7. Leadership and Teamwork 8. Ethics and Legal Responsibilities 9. Career Planning and Management 10. Technical Knowledge and Skills (see Program Technical Standards) 11. Demonstration and Application (see CTE Program Elements)

Critical Proficiency Template:	Attributes:
Program Technical Standards	Build on the Anchor Standards with more complexity, rigor, and career specificity
Academic Alignment	With VT Content-Area Graduation Proficiencies
CTE Program Elements	Demonstration and application: ● Dual Enrollment/Fast Forward Courses ● Industry Recognized Credentials (IRCs) ● Work-Based Learning/Co-op/Apprenticeship ● National Career Technical Student Organizations ● Entrepreneurship ● Portfolio/Personalized Learning Plan

VT Information Technology CTE Programs

Students in **Information Technology** programs have in-depth, hands-on experiences in managing and supporting rapidly emerging and evolving computer, networking, telecommunications, internet, software, programming, and information systems; project management; communicating and working on teams to manage flow of data.

The standards in this program area are designed to prepare students for technical training, postsecondary education, and/or entry-level employment in the field of information technology. 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**:	Aligned with **VT Transferable Skills** Proficiency-Based Graduation Requirements (PBGRs) and **VT Portrait of a Graduate**
1. Act as a responsible and contributing citizen and employee.	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.
2. Apply appropriate academic and technical skills.	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.
3. Attend to personal health and financial well-being.	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.

Advance CTE Common Career Technical Core - **Career Ready Practices**:	Aligned with **VT Transferable Skills** Proficiency-Based Graduation Requirements (PBGRs) and **VT Portrait of a Graduate**
4. Communicate clearly and effectively and with reason.	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.
5. Consider the environmental, social, and economic impacts of decisions.	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.
6. Demonstrate creativity and innovation.	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.
7. Employ valid and reliable research strategies.	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.

Advance CTE Common Career Technical Core - **Career Ready Practices**:	Aligned with **VT Transferable Skills** Proficiency-Based Graduation Requirements (PBGRs) and **VT Portrait of a Graduate**
8. Utilize critical thinking to make sense of problems and persevere in solving them.	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.
9. Model integrity, ethical leadership, and effective management.	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 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.
10. Plan education and career paths aligned to personal goals.	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.

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Advance CTE Common Career Technical Core - **Career Ready Practices**:	Aligned with **VT Transferable Skills** Proficiency-Based Graduation Requirements (PBGRs) and **VT Portrait of a Graduate**
11. Use technology to enhance productivity.	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.
12. Work productively in teams while using cultural global competence.	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.

Advance CTE Common Career Technical Core - **Information Technology** Career Cluster and Pathway Standards

The following Career Cluster and Pathway standards are relevant to VT Computer Systems, Computer Networking, Information Technology CTE programs:	This Career Cluster® is focused on building linkages in information technology occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia, and systems integration services.
Information Technology Career Cluster	1. Demonstrate effective professional communication skills and practices that enable positive customer relationships. 2. Use product or service design processes and guidelines to produce a quality information technology (IT) product or service. 3. Demonstrate the use of cross-functional teams in achieving IT project goals. 4. Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors. 5. Explain the implications of IT on business development. 6. Describe trends in emerging and evolving computer technologies and their influence on IT practices. 7. Perform standard computer backup and restore procedures to protect IT information.

The following Career Cluster and Pathway standards are relevant to VT Computer Systems, Computer Networking, Information Technology CTE programs:	This Career Cluster® is focused on building linkages in information technology occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia, and systems integration services.
	8. Recognize and analyze potential IT security threats to develop and maintain security requirements. 9. Describe quality assurance practices and methods employed in producing and providing quality IT products and services. 10. Describe the use of computer forensics to prevent and solve information technology crimes and security breaches. 11. Demonstrate knowledge of the hardware components associated with information systems. 12. Compare key functions and applications of software and determine maintenance strategies for computer systems.
Network Systems Pathway	1. Analyze customer or organizational network system needs and requirements. 2. Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power, security). 3. Design a network system using technologies, tools, and standards. 4. Perform network system installation and configuration. 5. Perform network administration, monitoring, and support to maintain a network system.
Web and Digital Communications Pathway	1. Analyze customer requirements to design and develop a Web or digital communication product. 2. Apply the design and development process to produce user-focused Web and digital communications solutions. 3. Write product specifications that define the scope of work aligned to customer requirements. 4. Demonstrate the effective use of tools for digital communication production, development, and project management. 5. Develop, administer, and maintain Web applications. 6. Design, create, and publish a digital communication product based on customer needs. 7. Evaluate the functionality of a digital communication product using industry accepted techniques and metrics. 8. Implement quality assurance processes to deliver quality

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	digital communication products and services. 9. Perform maintenance and customer support functions for digital communication products. 10. Comply with intellectual property laws, copyright laws, and ethical practices when creating Web/digital communications.
Information Support and Services Pathway	1. Provide technology support to maintain service. 2. Manage operating systems and software applications, including maintenance of upgrades, patches, and service packs. 3. Apply appropriate troubleshooting techniques in resolving computer hardware, software, and configuration problems. 4. Perform installation, configuration, and maintenance of operating systems. 5. Demonstrate the use of networking concepts to develop a network. 6. Evaluate the effectiveness of an information system. 7. Employ system installation and maintenance skills to set up and maintain an information system. 8. Employ system administration and control skills to monitor the performance of an information system. 9. Employ technical writing and documentation skills in support of an information system. 10. Apply quality assurance processes to maximize information system operation.
Programming and Software Development Pathway	1. Analyze customer software needs and requirements. 2. Demonstrate the use of industry standard strategies and project planning to meet customer specifications. 3. Analyze system and software requirements to ensure maximum operating efficiency. 4. Demonstrate the effective use of software development tools to develop software applications. 5. Apply an appropriate software development process to design a software application. 6. Program a computer application using the appropriate

The following Career Cluster and Pathway standards are relevant to VT Computer Systems, Computer Networking, Information Technology CTE programs:	This Career Cluster® is focused on building linkages in information technology occupations for entry level, technical and professional careers related to the design, development, support and management of hardware, software, multimedia, and systems integration services.
	programming language. 7. Demonstrate software testing procedures to ensure quality products. 8. Perform quality assurance tasks as part of the software development cycle. 9. Perform software maintenance and customer support functions. 10. Design, create, and maintain a database.

VT CTE Program Anchor Standards

Anchor Standards:	Aligned with Advance CTE Common Career Technical Core - Career Cluster Anchor Standards
1. Academics	Achieve additional academic knowledge and skills required to pursue the full-range of career and postsecondary education opportunities.
2. Communication	Acquire and accurately use terminology and information at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.
3. Problem Solving and Critical Thinking	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.
4. Technology	Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the workplace environment.
5. Systems (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.

Anchor Standards:	Aligned with Advance CTE Common Career Technical Core - Career Cluster Anchor Standards
6. Health and Safety	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.
7. Leadership and Teamwork	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.
8. Ethics and Legal Responsibilities	Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms.
9. Career Planning and Management	Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.
10. Technical Knowledge and Skills (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.
11. Demonstration and Application (see CTE Program Elements)	Demonstrate and apply technical knowledge and skills across a variety of CTE-specific opportunities in classroom, laboratory, and workplace settings.

VT Information Technology CTE Program Technical Standards

Program Technical Standards:	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
*Proficiencies 3 - 7 are common to all Information Technology Pathways.	

A. Network Systems Pathway	**1. Academic and Technical Foundations**
	   a. Analyze customer or organizational network system needs and requirements.
	   b. Evaluate wired and wireless network systems to

Program Technical Standards:	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
	determine if they meet specifications (e.g., IEEE, power, security). c. Describe network system installation and configuration. d. Explain network administration, monitoring, and support to maintain a network system. e. Demonstrate effective network administration and management skills. **2. Problem Solving and Critical Thinking** a. Design a network system using technologies, tools, and standards. b. Appraise security threats to a network and plan general methods to mitigate those threats.
B. Information Support and Services Pathway	**1. Academic and Technical Foundations** a. Support and train users on various software, hardware, and network systems. b. Manage operating systems and software applications, including maintenance of upgrades, patches, and service packs. c. Explain installation, configuration, and maintenance of operating systems. d. Describe the use of networking concepts to develop a network. e. Employ system installation and maintenance skills to set up and maintain an information system. f. Employ system administration and control skills to monitor the performance of an information system. g. Apply quality assurance processes to maximize information system operation. h. Describe the role of information and communication technologies in organizations. **2. Problem Solving and Critical Thinking** a. Evaluate the effectiveness of an information system. b. Apply appropriate troubleshooting techniques in resolving computer hardware, software, and configuration problems.
C. Web and Digital	**1. Academic and Technical Foundations**

Program Technical Standards:	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
Communications Pathway	a. Analyze customer requirements to design and develop a web or digital communication product. b. Write product specifications that define the scope of work aligned to customer requirements. c. Demonstrate the effective use of tools for digital communication production, development, and project management. d. Develop, administer, and maintain web applications. e. Implement quality assurance processes to deliver quality digital communication products and services. f. Identify and explain maintenance and customer support functions for digital communication products. **2. Problem Solving and Critical Thinking** a. Apply the design and development process to produce user-focused web and digital communications solutions. b. Design, create, and publish a digital communication product based on customer needs. c. Evaluate the functionality of a digital communication product using industry accepted techniques and metrics.
D. Programming and Software Development Pathway	**1. Academic and Technical Foundations** a. Analyze customer software needs and requirements. b. Explain the use of industry standard strategies and project planning to meet customer specifications. c. Analyze system and software requirements to ensure maximum operating efficiency. d. Demonstrate the effective use of software development tools to develop software applications. e. Explain software testing procedures to ensure quality products. f. Appraise quality assurance tasks as part of the software development cycle. g. Demonstrate software maintenance and customer

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Program Technical Standards:	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.

	support functions.
	
	 2. Problem Solving and Critical Thinking
	     a. Apply an appropriate software development process to design a software application.
	     b. Program a computer application using the appropriate programming language.
	     c. Design, create, and maintain a database.

E. Games and Simulation Pathway	**1. Academic and Technical Foundations**
	     a. Identify and describe critical game and simulation studies, the resulting societal impact, management, and the industry.
	     b. Explain game and simulation analysis, design, standard documentation, and development tools.
	     c. Identify, describe, and implement standard game/simulation strategy and rules of play.
	     d. Explain the role and principles of event modeling and interface design and apply those principles in a game/simulation design and project.
	     e. Apply and demonstrate appropriate programming skills for rendering a single player or multi user game or simulation project, including program control, conditional branching, memory management, scorekeeping, timed event strategies, and implementation issues.
	     f. Apply and demonstrate appropriate artificial intelligence (AI) techniques used by the game development industry.
	
	 2. Problem Solving and Critical Thinking
	     a. Create a working game or simulation individually or as part of a team.
	     b. Integrate music, sound, art, and animation as it applies to the environmental design of the game/simulation.

F. Cybersecurity Pathway	**1. Academic and Technical Foundations** a. Describe the critical factors of information security.

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Program Technical Standards:	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
	b. Explain cybersecurity services as they relate to intrusion prevention capabilities that protect systems against unauthorized access, exploitation, and data exfiltration. c. Identify the concepts of cybersecurity risk and threat management. d. Identify networks, services, protocols, and potential vulnerabilities. e. Identify, install, and configure basic hardware, motherboard, audio, video, storage, and other external devices. f. Describe software associated with information systems. g. Describe the importance of system maintenance and preventive measures. h. Distinguish between data, information, and knowledge; identify the most common ways data is collected, stored, utilized, and processed. i. Identify the components, functions, and types of operating systems. j. Define programming in the context of cybersecurity and differentiate between computer programming languages. k. Identify ubiquitous computing. l. Identify actions that constitute cyberbullying. **2. Problem Solving and Critical Thinking** a. Investigate trends in digital technology and emerging technologies as they relate to the future of the Internet. b. Create documents, relational databases, and spreadsheets for real-world business situations. c. Assess the effect and value of available firewalls and intrusion detection systems (IDS). d. Identify the perpetrators of different types of malicious hacking. e. Analyze types of current cyber threats; identify the prevention of and protections against cyber threats.

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Program Technical Standards:	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
	f. Explain how businesses and individuals can protect themselves against threats to their data (e.g., firewalls, encryption, disabling, backups, permissions). g. Explain how and why personal data is valuable to both an individual and to the organizations (e.g., governments, businesses) that collect it, analyze it, and make decisions based on it; identify ways to control and protect personal data. h. Evaluate the potential vulnerabilities, threats, and common exploits to an operating system. i. Describe the concept of malware and techniques to guard against it; evaluate critical operating system security parameters. j. Evaluate common programming flaws that lead to vulnerabilities and identify best practices in secure coding and design. k. Discuss security and privacy implications of ubiquitous computing.
*All Pathways:	**3. Safety, Tools, and Equipment** a. Identify essential tools and equipment. b. Select the proper tool for diagnostic and troubleshooting procedures. c. Demonstrate electrical and installation safety. **4. Communication** a. Demonstrate how to communicate and interpret information clearly in industry-standard visual and written formats. b. Effectively utilize communication (speaking, listening, reading, and writing) skills to work with clients and complete required tasks. **5. Leadership and Teamwork** a. Demonstrate leadership skills. b. Demonstrate an ability to work independently and as a member of the information technology team. c. Exhibit principles of digital citizenship.

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Program Technical Standards:	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.

	6. Ethics and Legal Responsibilities
	   a. Recognize ethical and legal responsibilities in information technology fields.
	   b. Examine state, federal, and international regulations related to technology.
	   c. Explain the difference between technology policies, privacy standards, and best practices.
	
	7. Career Development
	   a. Research, describe, and compare college and career opportunities and qualifications in information technology.
	   b. Identify the educational pathways for emerging information technology professionals.
	   c. Research the cyber threats and security measures related to career pathways.

VT Information Technology CTE Program - Academic Alignment with VT Content Area Graduation Proficiencies (PBGRs)

Graduation Proficiencies:	Indicators:
English Language Arts	High School 1. **Reading**: b, c, d, g 2. **Writing**: a, b, d, e 3. **Writing**: c 4. **Speaking and Listening**: a, b, d 5. **Speaking and Listening**: a, b, d 6. **Language**: a, c, e
Mathematics	High School 1. **Modeling**: a, b, c, d, e, f 2. **Number and Quantity**: c 3. **Algebra**: g, h, k 4. **Functions**: a, b, d 6. **Statistics and Probability**: a, e

Graduation Proficiencies:	Indicators:
Science	High School 2. **Physical Sciences**: Energy, Waves, and Electromagnetic Radiation: e, f 8. **Engineering, Technology, and Application of Science**: f
Global Citizenship/Social Studies	End of Gr. 12 **Inquiry**: Constructing compelling and supporting questions: a, d; Determining helpful sources: a **Civics**: Civic and Political Institutions: a; Processes, Rules, and Laws: a **Economics**: Economic Decision Making: a; Exchange and Markets: a **Geography**: Human Environment Interaction: Place, Regions, and Culture: a **Communicating Conclusions and Taking Informed Action**: Communicating: b
Media Arts	High School 1. **Create**: a, b, c 2. **Present**: a, b, c, d 3. **Respond**: b, d 4. **Connect**: a, b, c, d

VT Information Technology CTE Program Elements

Demonstration and Application:	Available Options:
Dual Enrollment/Fast Forward Courses	• **CCV:** Computer Applications (CIS-1041), Website Development (CIS-1151), Desktop Operating Systems (CIS-1350), Concepts of PC Hardware (CIS-2110 , Intro to Business (BUS-1010-VC50), Startup 802: An Entrepreneurial Mindset (BUS-1125-VC50), Intro to Computer Science (CIS-1100-VC50) • **VTC:** Introduction to Spreadsheets (CIS 1050) • **River Valley Community College:** Computer Graphics I (CSCI 213R) , Website Design (CSCI 103R), Computer Architecture and Operating Systems (CSCI 101R), Intro to C++ Programming (CSCI 175R), Intro to Networks (CSCI 110R), Computer Network Security (CSCI 212R)

Demonstration and Application:	Available Options:
Industry Recognized Credentials (IRCs)	**Tier 1:** ● Certiport - Internet and Computing Core Fundamentals ● OSHA 10 **Tier 2**: ● Certiport - Adobe Certified Professional - Illustrator ● Certiport - Adobe Certified Professional- Photoshop ● Certiport - Adobe Certified Professional - Premiere Pro ● CIW - Site Development Associate ● CompTIA A+ ● CompTIA Linux+ ● CompTIA Security+ ● WebProfessionals.org - Certified Apprentice Webmaster ● WebProfessionals.org - Certified Web Administrator Apprentice ● WebProfessionals.org - Certified Web Designer Associate ● WebProfessionals.org - Certified Web Designer Apprentice ● WebProfessionals.org - Certified Web Developer Apprentice ● ACT National Career Readiness Certificate - Levels 5, 6, or 7
National Career Technical Student Organizations (CTSOs)	● SkillsUSA ● Future Business Leaders of America (FBLA)
Work-Based Learning/Co-op (WBL)	Varies by CTE Center
Entrepreneurship Opportunities	Varies by CTE Center
Portfolio/Personalized Learning Plan (PLP)	Varies by CTE Center

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