**Course CYBER SECURITY**      **Instructor** CRAIG COLEMAN **Date** 2/16/18

**Career and Technical Education 21st Century Skills**

**LEARNING AND INNOVATION**

*Learning and innovation skills increasingly are being recognized as those that separate students who are prepared for a more and more complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future.*

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| **21st Century Skills** | | **LWSD Student Profile**  **Interdisciplinary Skills and attributes**  **LWSD Interdisciplinary Content Knowledge** | **Where do you teach this skill in your curriculum?** |  | **How do you teach this skill in your curriculum?** | **How do you assess this skill in your curriculum?** |
| **Creativity and Innovation** | **Think Creatively**   1. Use a wide range of idea creation techniques (such as brainstorming) 2. Create new and worthwhile ideas (both incremental and radical concepts) 3. Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts | **Academic Thinking Skills & Strategies**   * Questions Critically and Thinks Creatively * Solves Problems Effectively * Makes Connections | Students elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative web designs using HTML5 and CSS. |  |  |  |
| **Work Creatively with Others**  1.B.1 Develop, implement and communicate new ideas to others effectively  1.B.2 Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work  1.B.3 Demonstrate originality and inventiveness in work and understand the real world limits to adopting new ideas  1.B.4 View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes | **Communication & Collaboration Skills**   * Offers Ideas and Makes Contributions * Works Well with Others * Respects and Values Others   **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance | Students will view failure as an opportunity to learn when debugging source code using a variety of programming languages.  understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes |  |  |  |
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| **Creativity and INnovation** | **Implement Innovations**  1.C.1 Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur | **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance | Students will act on creative ideas to make a tangible and useful contribution group programming projects such as the Python group graphics project. |  |  |  |

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| ***+***  ***Critical Thinking and Problem Solving*** | **Reason Effectively**  2.A.1 Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation | **Academic Thinking Skills & Strategies**   * Questions Critically and Thinks Creatively * Solves Problems Effectively * Makes Connections | Students will use Use various types of reasoning as appropriate to the situation when designing a networking in the Network Bid Simulation. |  |  |  |
| **Use Systems Thinking**  2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems | **Academic Thinking Skills & Strategies**   * Questions Critically and Thinks Creatively * Solves Problems Effectively * Makes Connections | Students will analyze how parts of a whole interact with each other to produce a web-based authentication application. (User login) |  |  |  |
| **Make Judgments and Decisions**   1. Effectively analyze and evaluate evidence, arguments, claims and beliefs 2. Analyze and evaluate major alternative points of view 3. Synthesize and make connections between information and arguments 4. Interpret information and draw conclusions based on the best analysis 5. Reflect critically on learning experiences and processes | **Academic Thinking Skills & Strategies**   * Questions Critically and Thinks Creatively * Solves Problems Effectively * Makes Connections | Students will analyze and evaluate major alternative points of view writing their personal Computer Ethics document. |  |  |  |
| **Solve Problems**   1. Solve different kinds of non-familiar problems in both conventional andinnovative ways 2. Identify and ask significant questions that clarify various points of view and lead to better solutions | **Academic Thinking Skills & Strategies**   * Questions Critically and Thinks Creatively * Solves Problems Effectively * Makes Connections | Students will solve different kinds of non-familiar problems in both conventional and innovative ways creating CTF (Capture The Flag) cyber security problems.  Students will identify and ask significant questions that clarify various points of view and lead to better solutions when designing a virtual network. |  |  |  |

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| ***Communication and Collaboration*** | **Communicate Clearly**   1. Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts 2. Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions 3. Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade) 4. Utilize multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact 5. Communicate effectively in diverse environments (including multi-lingual) | **Communications & Collaboration Skills**   * Offers Ideas and Makes Contributions * Works Well with Others * Respects and Values Others   **Literacy & Language**   * Writes clearly and effectively … for a variety of audiences and purposes * Reads, interprets, analyzes, and evaluates … texts * Understands and applies the commonly accepted rules and conventions * Communicates effectively in a language other than English   **Information and Communication Technology (ICT)**   * Demonstrates information communication, and media literacy * Understands the relationship of technology to productivity and quality of life * Presents information for a variety of audiences and purposes using a range of ICT Tools | Students will listen effectively to decipher meaning, including knowledge, values, attitudes and intentions during SAFETY TRAINING. |  |  |  |
| **Collaborate with Others**   1. Demonstrate ability to work effectively and respectfully with diverse teams 2. Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal 3. Assume shared responsibility for collaborative work, and value the individual contributions made by each team member | **Communications & Collaboration Skills**   * Offers Ideas and Makes Contributions * Works Well with Others * Respects and Values Others   **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance | Students will demonstrate ability to work effectively and respectfully when working on CAT 5e networking cabling. (RJ45 Modular Jacks and 568B Punch Down) |  |  |  |

**Career and Technical Education 21st Century Skills**

**INFORMATION, MEDIA AND TECHNOLOGY SKILLS**

*People in the 21st century live in a technology and media-suffused environment, marked by various characteristics, including: 1) access to an abundance of information, 2) rapid changes in technology tools, and 3) the ability to collaborate and make individual contributions on an unprecedented scale. To be effective in the 21st century, citizens and workers must be able to exhibit a range of functional and critical thinking skills related to information, media and technology.*

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| ***Information Literacy*** | **Access and Evaluate Information**   1. Access information efficiently (time) and effectively (sources) 2. Evaluate information critically and competently | **Information and Communication Technology (ICT)**   * Demonstrates information communication, and media literacy * Understands the relationship of technology to productivity and quality of life * Presents information for a variety of audiences and purposes using a range of ICT Tools   **Academic Thinking Skills & Strategies**   * Questions Critically and Thinks Creatively * Solves Problems Effectively * Makes Connections | Students will access and evaluate information when creating a bid for proposal when designing a custom-made computer. |  |  |  |
| **Use and Manage Information**   1. Use information accurately and creatively for the issue or problem at hand 2. Manage the flow of information from a wide variety of sources 3. Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information | Students will use and manage information when creating a report from access log data derived from a web server. |  |  |  |

**Career and Technical Education 21st Century Skills**

**LIFE AND CAREER SKILLS**

*Today’s life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills.*

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| ***Flexibility and Adaptability*** | **Adapt to Change**   1. Adapt to varied roles, jobs responsibilities, schedules and contexts 2. Work effectively in a climate of ambiguity and changing priorities | **Communications & Collaboration Skills**   * Offers Ideas and Makes Contributions * Works Well with Others * Respects and Values Others   **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance | Students will adapt to a change of schedule when working on group projects with other programs at Tri-Tech |  |  |  |
| **Be Flexible**   1. Incorporate feedback effectively 2. Deal positively with praise, setbacks and criticism 3. Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments | **Communications & Collaboration Skills**   * Offers Ideas and Makes Contributions * Works Well with Others * Respects and Values Others   **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance | Students will learn to be flexible when given feedback on web design when using HTML to create web sites and change the design. |  |  |  |

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| ***Initiative and Self-Direction*** | **Manage Goals and Time**   1. Set goals with tangible and intangible success criteria 2. Balance tactical (short-term) and strategic (long-term) goals 3. Utilize time and manage workload efficiently | **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance | Students manage goals and time with respect to a group github.com programming assignemt, |  |  |  |
| **Work Independently**  8.B.1 Monitor, define, prioritize and complete tasks without direct oversight | **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance | Student will monitor, define, prioritize and complete tasks without direct oversight during a long term culminating project. |  |  |  |
| **Be Self-Directed Learners**   1. Go beyond basic mastery of skills and/or curriculum to explore and expand one’s own learning and opportunities to gain expertise 2. Demonstrate initiative to advance skill levels towards a professional level 3. Demonstrate commitment to learning as a lifelong process 4. Reflect critically on past experiences in order to inform future progress | **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance | Advanced:  Demonstrate initiative to advance skill levels towards a professional level by participating in the Cyber Patriot National Cyber Security competition. |  |  |  |

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| ***Social and Cross-Cultural*** | **Interact Effectively with Others**   1. Know when it is appropriate to listen and when to speak 2. Conduct themselves in a respectable, professional manner | **Communications & Collaboration Skills**   * Offers Ideas and Makes Contributions * Works Well with Others * Respects and Values Others | Students will conduct themselves in a respectable professional manner during cross program group projects. |  |  |  |
| **Work Effectively in Diverse Teams**   1. Respect cultural differences and work effectively with people from a range ofsocial and cultural backgrounds 2. Respond open-mindedly to different ideas and values 3. Leverage social and cultural differences to create new ideas and increase both innovation and quality of work | **Communications & Collaboration Skills**   * Offers Ideas and Makes Contributions * Works Well with Others * Respects and Values Others   **Local & Global Citizenship Skills**   * Exhibit Civic Responsibility * Maintain a Local Perspective * Maintain a Global Perspective | Students will communicate open-mindedly to different ideas and values when working on a group html web design project. |  |  |  |

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| ***Productivity and Accountability*** | **Manage Projects**   1. Set and meet goals, even in the face of obstacles and competing pressures 2. Prioritize, plan and manage work to achieve the intended result | **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance   Career Planning & Life Management   * Understands and develops entrepreneurial and management skills and strategies | Students will prioritize, plan and manage work to achieve the intended result when working on a culminating project. |  |  |  |
| **Produce Results**   1. Demonstrate additional attributes associated with producing high qualityproducts including the abilities to: 2. Work positively and ethically 3. Manage time and projects effectively 4. Multi-task 5. Participate actively, as well as be reliable and punctual 6. Present oneself professionally and with proper etiquette 7. Collaborate and cooperate effectively with teams 8. Respect and appreciate team diversity 9. Be accountable for results | **Communications & Collaboration Skills**   * Offers Ideas and Makes Contributions * Works Well with Others * Respects and Values Others   **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance | Students will demonstrate abilities to multi-task when completing portfolio documents will working simulations on other projects. |  |  |  |

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| ***Leadership and Responsibility*** | **Guide and Lead Others**   1. Use interpersonal and problem-solving skills to influence and guide others toward a goal 2. Leverage strengths of others to accomplish a common goal 3. Inspire others to reach their very best via example and selflessness 4. Demonstrate integrity and ethical behavior in using influence and power | **Personal Attributes**   * Exhibits a Strong Work Ethic * Takes Personal Responsibility * Demonstrates Resiliency * Maintains Balance   Career Planning & Life Management   * Understands and develops entrepreneurial and management skills and strategies   **Academic Thinking Skills & Strategies**   * Questions Critically and Thinks Creatively * Solves Problems Effectively * Makes Connections | Students will leverage the strengths of others to accomplish a group Python programming assignment with final code posted on Github.com |  |  |  |
| **Be Responsible to Others**  11.B.1 Act responsibly with the interests of the larger community in mind | **Local & Global Citizenship Skills**   * Exhibit Civic Responsibility * Maintain a Local Perspective * Maintain a Global Perspective | Students will act responsibly with the interests of the larger community in mind when writing their personal Computer ethics document. |  |  |  |