**Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_**

**PROGRAM COMPETENCY PROFILE FOR CAREER TECHNICAL EDUCATION**

**Career Cluster: Information Technology**

**Program Name: Computer Systems Networking and Telecommunications CIP: 110901** Effective 8/09 National Standard: CompTIA A+

| **Competencies**  (statement that provides the overview and defines the instructional area) **Student will:** | **Knowledge, Content and Skills**  (what a student needs to know and be able to do and upon which they will be assessed )  **Student will:** | **NH Common Core State Standards – Aligned**  **English/Language**  **Arts/Literacy: E**  **Mathematics: M**  **Science: S**  **Art: A** | **Rating Scale -Sample Performance Assessments**  (Performance tasks the student needs to demonstrate in order to be rated proficient in meeting the competency)  **Student will:** |
| --- | --- | --- | --- |
| **Understand the basic concepts of PC**  **computer assembly, troubleshooting and repair in order to**  **effectively troubleshoot and repair equipment in a timely manner.** | 1. Identify basic terms, concepts, and functions of system modules, including how each module works during normal operation. **AAI 4. Technical and Production Skills**: Identify specific production and technical skills required for this industry. |  | 1 2 3 4 |
| 2. Identify basic procedures for adding and removing field replaceable modules. |  | 1 2 3 4 |
| 3. Identify the necessary system resources and procedures for configuring them for device installation. |  | 1 2 3 4 |
| 4. Identify common peripheral ports, associated cabling, and their connectors. |  | 1 2 3 4 |

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| --- | --- | --- | --- |
|  | 5. Identify ESD (Electrostatic Discharge) precautions and procedures.  **AAI 8. Health, Safety, and Environment**: Explain the health and safety laws and practices affecting the employee, the surrounding community, and the environment in this industry. |  | 1 2 3 4 |
| 6. Identify the purpose of BIOS, what it contains, and how to change it. |  | 1 2 3 4 |
| 7. Identify the basic functions, components and interfaces of the major commercial and open source operating systems. |  | 1 2 3 4 |
| 8. Identify the basic procedure for installing OS software, including DOS and Windows. |  | 1 2 3 4 |
| 9. Identify the proper procedure for removing and creating partitions on a hard drive. |  | 1 2 3 4 |
| 10. Identify printer technologies, interfaces, and options/upgrades. |  | 1 2 3 4 |

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| --- | --- | --- | --- |
|  | 11. Recognize common printer problems and techniques used to resolve them. |  | 1 2 3 4 |
| 12. Identify basic concepts and procedures for creating, viewing, and managing disks, directories and files. |  | 1 2 3 4 |
| 13. Identify techniques of information assurances such as: back-up procedures, data security, storage, offsite and RAID. |  | 1 2 3 4 |
| 14. Identify the basic system boot sequences and boot methods, including the steps to remedy Boot problems.  **AAI 4. Technical and Production Skills**: Identify specific production and technical skills required for this industry. |  | 1 2 3 4 |
| 15. Discuss proper disposal of equipment and materials. |  | 1 2 3 4 |

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**Career Cluster: Information Technology**

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| --- | --- | --- | --- |
| **Understand the basic concepts of network construction in order to design, build and**  **connect hardware to allow people to**  **communicate securely in a timely fashion.** | 16. Demonstrate a basic knowledge of topologies, segments, and backbones. |  | 1 2 3 4 |
| 17. Explain the layers of the OSI and TCP/I Models. |  | 1 2 3 4 |
| 18. Describe the major network operating systems and their similarities and differences. **AAI 5. Underlying Principles of**  **Technology**: Explain through discussion the technological systems used within this industry. |  | 1 2 3 4 |
| 19. Recognize and describe the advantages and disadvantages of various networking media. |  | 1 2 3 4 |
| 20. Use TCP/IP troubleshooting utilities such as PING and Tracert/Traceroute to test IP connectivity. |  | 1 2 3 4 |

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| --- | --- | --- | --- |
|  | 21. Select, Terminate and test media |  | 1 2 3 4 |
| 22. Describe the components of an effective security policy, including standard password practices. |  | 1 2 3 4 |
| 23. Describe and contrast LAN and WAN technologies and virtual networks.  **AAI 5. Underlying Principles of**  **Technology**: Explain through discussion the technological systems used within this industry. |  | 1 2 3 4 |
| 24. Explain the characteristics of networking standards. |  | 1 2 3 4 |
| 25. Explain the characteristics of various types of malware and the means of  prevention. |  | 1 2 3 4 |

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| --- | --- | --- | --- |
|  | 26. Identify procedures for establishing Internet connectivity.  **AAI 5. Underlying Principles of**  **Technology**: Explain through discussion the technological systems used within this industry. |  | 1 2 3 4 |
| 27. Explain network planning and  documentation |  | 1 2 3 4 |
| **Understand the basic concepts of operating a network infrastructure in order to select the proper network**  **protocols to build a**  **secure network.** | 28. Describe the major advantages and disadvantages of share folder and file level security on a network. |  | 1 2 3 4 |
| 29. Design and construct a peer-to-peer network. |  | 1 2 3 4 |
| 30. Design a client-server network. |  | 1 2 3 4 |
|  | 31. Create and administer groups, users, application and data folders and allocate user system resources.  **AAI 4. Technical and Production Skills**: Identify specific production and technical skills required for this industry. |  | 1 2 3 4 |

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| --- | --- | --- | --- |
|  | 32. Install File and folder level security on a network. |  | 1 2 3 4 |
| 33. Install and share a printing device on a network. |  | 1 2 3 4 |
| **Understand**  **communication**  **concepts and**  **techniques in order to provide quality**  **customer/client service** | 34. Identify the principal written, verbal and interpersonal skills required for help desk success. |  | 1 2 3 4 |
| 35. Describe customer expectations from help desk support. |  | 1 2 3 4 |
|  | 36. Identify the elements of proper  communications. |  | 1 2 3 4 |
|  | 37. Research and identify telephone  technologies such as voice mail, fax-on demand, Automatic Call Direct, Voice Response Unit and remote access. |  | 1 2 3 4 |

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| --- | --- | --- | --- |
|  | 38. Describe the basic elements of a comprehensive support center. |  | 1 2 3 4 |
| **Understand the**  **fundamental concepts of entrepreneurship and how**  **entrepreneurship**  **influences the economy** | 39. Discuss and assess venture creation possibilities and identify the steps in planning the venture.  **AAI 1. Planning**: Explain the key elements of a long-term plan for a successful company. **AAI 2. Management**: Discuss the different forms of management and ownership within  this industry.  **AAI 3. Finance**: Explain the key  components of financial management of a company. |  | 1 2 3 4 |
|  | 40. Identify the resources needed for venture startup and operation. |  | 1 2 3 4 |

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| --- | --- | --- | --- |
|  | 41. Discuss the options in planning the venture’s future (growth, development, demise).  **AAI 6. Labor Issues**: Explain the  employees’ and employers’ rights and responsibilities in this industry.  **AAI 7. Community Issues**: Discuss the ways a company can impact its community and the ways a community can impact a company. |  | 1 2 3 4 |
| 42. Identify and discuss the traits and behaviors of an entrepreneur (leadership, personal assessment, personal management). |  | 1 2 3 4 |
| **Understand the**  **importance of personal growth and leadership to enhance career**  **success** | 43. Demonstrate personal growth, community leadership, democratic principles and social responsibility by participating in  activities/events offered through student organizations. |  | 1 2 3 4 |

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| --- | --- | --- | --- |
| **Understand the**  **necessary employability skills in order to**  **achieve success in**  **today’s workplace** | 44. **Decision-Making & Problem-Solving:** Demonstrate and apply good decision making and problem-solving skills by outlining issues in situations/problems and determining, collecting, and organizing information needed in order to formulate a solution. |  | 1 2 3 4  **For Example:**  - create an outline  - create a troubleshooting log  - make class presentation  - develop and test strategies or options that work  - provide examples of the strategies or options tested or tried - compare and analyze pros and cons of identified strategies or options  - through teamwork, arrive at a decision or determine a solution that is well suited to the task  - independently arrive at a decision or determine a solution that is well suited to the task  - communicate in a clear format how the solution was formed - justify or describe how and why a particular solution option was chosen |

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| --- | --- | --- | --- |
|  | 45. **Self-Management:**  Demonstrate and apply self-management skills by adhering to regulations, being responsible and following through on commitments.  **AAI 9. Personal Work Habits**: Explain the work habits an employer looks for in an employee in this industry. |  | 1 2 3 4  **For Example:**  - have a written test on applicable policies and procedures - assess student orientation knowledge through instructor observations and written unit test  - review student handbook  - adhere to regulations in school, classroom, and everyday settings - build trust by being consistent, dependable, and verbally positive with others  - ask questions and listen to others  - keep track of assignments and/or responsibilities  - have work done on time  - respond positively to constructive feedback  - show respect for others and their points of view  - set individual goals and document progress toward achieving those goals  - take initiative to pursue learning  - adapt as necessary to create a positive outcome for self and others - advocate appropriately for himself/herself |

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| --- | --- | --- | --- |
|  | 46. **Communication Skills:**  Demonstrate and apply effective  communication skills: verbal, written, visual and listening. |  | 1 2 3 4  **For Example:**  - be given a work order that contains written instructions of a specific job and complete the work order  - create a power point presentation  - participate in a debate  - perform mock interviews  - develop a topic  - include details to support a main point  - use appropriate grammar and sentence structure  - organize writing and/or presentation materials  - use constructive feedback to improve skill  - participate in discussion and conversation by listening, entering in, taking turns, responding to others’ remarks, asking questions, summarizing and closing, as appropriate to the given context - use varied vocabulary for clarity and effectiveness  - support his/her ideas in a public forum using the appropriate visual/audio aides  - select and use the appropriate media and method(s) to communicate the subject effectively  - adapt writing, speaking, and/or visual presentations effectively to a particular audience  - act on or respond appropriately to verbal and non-verbal cues from the audience |

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| --- | --- | --- | --- |
|  | 47. **Ability to Work with Others:**  Demonstrate and apply the necessary skills in order to work effectively with others. |  | 1 2 3 4  **For Example:**  - role play a situation in which there is a conflict which must be resolved  - compose a list of what she/he believes to be the most common problems within that profession after reviewing appropriate work ethics standards  - conduct an interview with a manager and share report with classmates  - demonstrate knowledge of individual strengths he/she brings to a group  - demonstrate knowledge of and respect for cultural and individual differences  - demonstrate beginning skills in conflict management by outlining the issues involved and others’ points of view  - demonstrate knowledge of the possible roles and responsibilities that individuals assume while working with others  - demonstrate knowledge of group skills: listening, brainstorming, clarifying information, showing initiative, acknowledging contributions, defining group tasks, and responding positively to constructive feedback  - demonstrate increasing skills in conflict management by brainstorming a variety of solutions and their possible outcomes - assume responsibilities within a group  - demonstrate the use of group skills in a way that enhances a group’s performance  - demonstrate skills in conflict management by describing, justifying, and applying a resolution process, and reflecting on the outcome |

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| --- | --- | --- | --- |
|  | 48. **Information Use - Research, Analysis, Technology:**  Demonstrate and apply the use of information through research, analysis, and technology. |  | 1 2 3 4  **For Example:**  - do a research project and develop a presentation for the class - keep a daily notebook  - show use of a plan for gathering information  - gather information from a variety of sources, using a variety of technologies  - use sources that are current and appropriate to the topic - evaluate sources for correct and trustworthy information - document sources of information appropriately  - demonstrate and apply the skills in using software applications (MS Office)  - use a filing/organization system for information, such as notebook, disk, etc.  - justify the use of a particular organizational system for a particular product  - demonstrate effective communication skills (written, oral, listening) - effectively present a thesis, supporting evidence, and a conclusion using a variety of media |

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| --- | --- | --- | --- |
|  | 49. **Mathematical Concepts:**  Demonstrate mathematical and computation skills as applied to real world situations. |  | 1 2 3 4  **For Example:**  - keep a log of all possible uses of mathematics noticed throughout the class/lab/worksite  - compute accurately, applying addition, subtraction, multiplication, and division on real numbers, fractions, percents, and decimals  - collect, interpret, organize and display relevant data for solving a mathematics problem  - translate real world problems into mathematical representations - express and present mathematical ideas clearly in everyday written and oral language  - express in written and oral language how mathematics connects to other contexts outside the mathematics classroom  - use basic numerical concepts such as whole numbers and percentages in practical situations; make reasonable estimates of arithmetic results without a calculator; and use tables, graphs, diagrams, and charts to obtain or convey quantitative information  - approach practical problems by choosing appropriately from a variety of mathematical techniques; use quantitative data to construct logical explanations for real world situations; express mathematical ideas and concepts orally and in writing; and understand the role of chance in the occurrence and prediction of events |

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| --- | --- | --- | --- |
|  | 50. **General Safety:**  Demonstrate and apply safe practices and procedures in the workplace. |  | 1 2 3 4  **For Example:**  - develop scenarios of hazards and accidents using publications and the internet  - be observed by teacher  - take written quizzes/written tests  - demonstrate knowledge of safety and sanitation practices and procedures  - identify and report hazardous conditions and safe working procedures  - use personal protective equipment and clothing |
| 51. **Career Development:**  Demonstrate personal/career development skills by completing a career plan. |  | 1 2 3 4  **For Example:**  - complete a self-awareness inventory  - develop a career portfolio  - use a career software, such as Choices, to measure their aptitudes and abilities for particular careers  - use available resources (college catalogs and websites) to research information about postsecondary educational opportunities - select a career in the field and outline educational and skill requirements, expected job growth, and salaries  - review with teacher software printout to assess their aptitudes and abilities  - make appropriate choices in pursuit of postsecondary education or training and/or direct entry into the world of work  - plan a senior experiential project to review and evaluate a variety of career choices |

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