**Standards – Iowa Information Solutions Committee and Advance CTE**

**(Adopted by the Iowa Department of Education as State foundational standards for secondary programs in Information Solutions/Technology)**

Information Solution/Technology Courses: (Minimum of 2 Carnegie Units)

Course 1

Course 2

Course 3

Course 4

Core Courses – 1 Unit of program courses can be courses shared with other CTE areas. If necessary for your program, we recommend Introduction to Computers/Computer Applications (through the Business Program) or Careers, Internships, etc.

The standards below should be used for all Information Technology Programs. If your program is a general Computer Science program using the CIP identified below, these standards should be followed and selected standards from the other clusters could be incorporated into your program.

General Computer Science Program  
CIP: 11.07010000

**Cluster Topic: BUSINESS SKILLS:**   
Understand business concepts, tools, and creativity necessary in the workplace

**FOUNDATION Standard 1:** Utilize computing devices (e.g., printers, phone, digital cameras, multi-media equipment, video and scanners)

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate touch keyboarding and use computer functions to create documents |  |  |  |  |  |  |
| Select and use appropriate digital tools for solving problems |  |  |  |  |  |  |
| Demonstrate the functionality of computing devices and identify proper usage |  |  |  |  |  |  |

**FOUNDATION Standard 2:** Demonstrate workplace expectations (e.g. dress, promptness, attendance, interpersonal skills, completion of assigned tasks)

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Identify and list workplace expectations |  |  |  |  |  |  |
| Compare school expectations to work expectations |  |  |  |  |  |  |
| Demonstrate punctuality |  |  |  |  |  |  |
| Demonstrate teamwork skills |  |  |  |  |  |  |
| Explain the relationship between team and individual performance |  |  |  |  |  |  |
| Demonstrate appropriate electronic etiquette |  |  |  |  |  |  |

**FOUNDATION Standard 3:** Identify IT organization structures and roles

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Identify the organizational structure of an IT department |  |  |  |  |  |  |
| Identify various roles in IT (e.g. help desk, system administrator, programmers, analyst, project managers) |  |  |  |  |  |  |
| Identify examples of chains of command and the communication channels within an organization |  |  |  |  |  |  |

**FOUNDATION Standard 4:** Describe current trends in technology

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Discuss new technologies (e.g. cloud computing, outsourcing, mobile, artificial intelligence, data analytics, digital currency) |  |  |  |  |  |  |
| Describe types of businesses and how technology impacts the business |  |  |  |  |  |  |
| Compare and contrast online business vs. brick and mortar business |  |  |  |  |  |  |
| Explain the importance of security |  |  |  |  |  |  |

**FOUNDATION Standard 5:** Discuss and understand challenges and opportunities facing the IT industry

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Discuss the pace of change in technology and how it affects business |  |  |  |  |  |  |
| Understand the difference between in-house IT and outsourced IT and how to work with removed workers |  |  |  |  |  |  |
| Understand the IT employment opportunities and job growth and how it affects the IT student futurereadyiowa.gov |  |  |  |  |  |  |
| Demonstrate an awareness of potential government compliance requirements (e.g. patient privacy, confidentiality, security) |  |  |  |  |  |  |

**FOUNDATION Standard 6:** Demonstrate the ability to understand business information

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate understanding of core business processes (marketing, finance, sales, and operations) and how it affects IT |  |  |  |  |  |  |
| Demonstrate understanding of reporting tools (dashboards, spreadsheets, and charts) |  |  |  |  |  |  |

**FOUNDATION Standard 7:** Recognize legal and ethical issues related to information technology

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Research the Code of Ethics for a professional IT organizations such as Association for Information Technology Professionals |  |  |  |  |  |  |
| Identify illegal and unethical activities and practices |  |  |  |  |  |  |
| Research the penalties for software copyright violations |  |  |  |  |  |  |
| Discuss the difference between open source and proprietary information |  |  |  |  |  |  |
| Understand ownership of information |  |  |  |  |  |  |

**FOUNDATION Standard 8:** Demonstrate an understanding of the need for security from a business standpoint

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Research recent security events that have affected businesses and discuss their impact |  |  |  |  |  |  |
| Identify common security threats such as hacking, viruses, phishing, malware, and physical security |  |  |  |  |  |  |
| Demonstrate best practices as a user to prevent security breaches |  |  |  |  |  |  |
| Compare various security measures, considering tradeoffs between the usability and security of a computer system |  |  |  |  |  |  |
| Explain tradeoffs when selecting and implementing cybersecurity recommendations |  |  |  |  |  |  |

**FOUNDATION Standard 9:** Understand basic software applications

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate operation of e-mail, word processing, spreadsheets, presentation software, and database application software |  |  |  |  |  |  |
| Show working knowledge of collaborative tools and online resource |  |  |  |  |  |  |
| Demonstrate working knowledge of different search engines |  |  |  |  |  |  |

**Cluster Topic: TECHNICAL SKILLS**

Understand the basic skills necessary to work in the IT Industry

**FOUNDATION Standard 1:** Demonstrate an understanding of what role an operating system plays

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate the understanding of directory structures (folders, files, etc.) |  |  |  |  |  |  |
| Demonstrate an understanding of how to configure devices |  |  |  |  |  |  |
| Understand the role of users in an operating system |  |  |  |  |  |  |
| Demonstrate knowledge of the different types of operating systems – (e.g. Windows, apple, Linux, IOS, Android, Chrome) |  |  |  |  |  |  |
| Describe the difference between applications and the operating system and how the dependencies of each work |  |  |  |  |  |  |
| Evaluate the scalability and reliability of networks by describing the relationship between routers, switches servers, topology, and addressing |  |  |  |  |  |  |
| Translate between different bit representations of real-world phenomena, such as characters, numbers and images |  |  |  |  |  |  |

**FOUNDATION Standard 2:** Use logic to solve problems and demonstrate trouble-shooting skills

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Develop a plan to troubleshoot an identified technical issue |  |  |  |  |  |  |
| Demonstrate initiative to independently solve problems and troubleshoot |  |  |  |  |  |  |
| Understand the resources available to troubleshoot an issue |  |  |  |  |  |  |
| Demonstrate the ability to obtain information from a user to identify the root cause of an issue |  |  |  |  |  |  |
| Implement steps to prevent the issue from happening in the future |  |  |  |  |  |  |

**FOUNDATION Standard 3:** Use logic to solve problems and demonstrate trouble-shooting skills

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Develop a plan to troubleshoot an identified technical issue |  |  |  |  |  |  |
| Demonstrate initiative to independently solve problems and troubleshoot |  |  |  |  |  |  |
| Understand the resources available to troubleshoot an issue |  |  |  |  |  |  |
| Demonstrate the ability to obtain information from a user to identify the root cause of an issue |  |  |  |  |  |  |
| Implement steps to prevent the issue from happening in the future |  |  |  |  |  |  |

**FOUNDATION Standard 4:** Demonstrate knowledge of the hardware components associated with Information Systems

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate a knowledge of the difference between hardware and software |  |  |  |  |  |  |
| Compare and contrast the difference between a virtual machine and a physical machine |  |  |  |  |  |  |
| Define the different components of a computing device (CPU, memory, hard drive) |  |  |  |  |  |  |
| Identify common peripherals (printers, cameras, back-up devices, scanners) |  |  |  |  |  |  |
| Discuss the basic elements of cloud computing |  |  |  |  |  |  |
| Demonstrate the ability to create a virtual machine (VMWare, Xen) |  |  |  |  |  |  |

**FOUNDATION Standard 5:** Demonstrate math skills

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate the relationship between different numbering systems (binary, decimal, hex) |  |  |  |  |  |  |
| Demonstrate the ability to use a spreadsheet to create formulas and graphic representations of the data |  |  |  |  |  |  |

**FOUNDATION Standard 6:** Demonstrate the ability to use technical documents

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate the ability to use the internet to research and find answers to technical issues |  |  |  |  |  |  |
| Access the reliability of online documentation |  |  |  |  |  |  |
| Demonstrate the working knowledge of a flow chart or decision tree documentation |  |  |  |  |  |  |
| Evaluate the ability of models and simulations to test and support the hypotheses |  |  |  |  |  |  |
| Use data sets to support a claim or communicate information |  |  |  |  |  |  |
| Use tools to identify patterns in data representing complex systems |  |  |  |  |  |  |

**FOUNDATION Standard 7:** Demonstrate the basic design process of a project

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Create a prototype that uses algorithms to solve computational problems by leveraging prior student knowledge and personal interests |  |  |  |  |  |  |
| With a team, design, and develop computational artifacts for practical intent, personal expression, or to address a societal issues by using events to initiate instructions |  |  |  |  |  |  |
| Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables |  |  |  |  |  |  |
| Demonstrate the function and purpose of the project you are designing using constructs such as procedures, modules, and/or objects |  |  |  |  |  |  |
| Demonstrate the ability to describe the business requirements and how the solution satisfies the business theme |  |  |  |  |  |  |
| Document design decisions using text, graphics, presentations, and/or demonstration in the development of complex programs |  |  |  |  |  |  |
| Demonstrate the ability to describe the business requirements and how the solution satisfies the business theme and how it could possibly be used in other disciplines |  |  |  |  |  |  |
| Describe a methodology of testing your project |  |  |  |  |  |  |
| Describe how improvements or user feedback would be incorporated in the project |  |  |  |  |  |  |
| Understand the unique needs for accessibility for all users |  |  |  |  |  |  |

**FOUNDATION Standard 8:** Understand Computational Systems

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Understand the integration of a computer system within other devices and discuss how they work together |  |  |  |  |  |  |

**FOUNDATION Standard 9:** Utilize algorithms to understand computer programming and processes

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Illustrate the flow of execution of a recursive algorithm |  |  |  |  |  |  |
| Construct solutions to problems using student-created components such as procedures, modules and or objects |  |  |  |  |  |  |
| Demonstrate code reuse by creating programming solutions using libraries and APIs |  |  |  |  |  |  |
| Plan and develop programs for broad audiences using a software life cycle process |  |  |  |  |  |  |
| Develop programs for multiple computing problems |  |  |  |  |  |  |
| Use version control systems, integrated development environment (IDEs), and collaborative tools and practices (code documentation) in a group software project |  |  |  |  |  |  |
| Compare multiple programming languages and discuss how t heir features make them suitable for solving different types of problems. |  |  |  |  |  |  |

**Cluster Topic: COMMUNICATION**

Understand concepts, strategies and methods needed to interact and collaborate with others

**FOUNDATION Standard 1:** Understand customer interaction requirements

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Explain the importance of maintaining communication with the customer |  |  |  |  |  |  |
| Identify customer expectations in a given situation |  |  |  |  |  |  |
| Create a basic requirements document and technical response document that addresses the user needs |  |  |  |  |  |  |
| Demonstrate the ability to prioritize tasks |  |  |  |  |  |  |
| Demonstrate the ability to plan according to people and resource needs and constraints and follow through to ensure you have met customer expectations |  |  |  |  |  |  |

**FOUNDATION Standard 2:** Demonstrate the ability to communicate technical issues in a non-technical manner

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Create concise documentation and reports |  |  |  |  |  |  |
| Explain the importance of obtaining feedback from your audience and adjust presentation accordingly |  |  |  |  |  |  |
| Describe a technical topic to a non-technical person |  |  |  |  |  |  |

**FOUNDATION Standard 3:** Demonstrate ability to train users

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Understand the different learning styles of your audience |  |  |  |  |  |  |
| Identify users knowledge level and plan training accordingly |  |  |  |  |  |  |
| Demonstrate ability of how to use various technologies |  |  |  |  |  |  |
| Assess training outcomes |  |  |  |  |  |  |

**FOUNDATION Standard 4:** Demonstrate the ability to work as a team member

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Offer contrasting viewpoints |  |  |  |  |  |  |
| Define and communicate workload limits |  |  |  |  |  |  |
| Understand the importance of communicating with others |  |  |  |  |  |  |
| Understand conflict resolution in a team setting |  |  |  |  |  |  |
| Understand cultural differences in communication |  |  |  |  |  |  |

**FOUNDATION Standard 5:** Demonstrate ability to communicate professionally both verbally in writing (e.g. resumes, cover letters, reports, interviews, e-mails)

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Role play interviews for requirements gathering for a project |  |  |  |  |  |  |
| Write a short report covering the issues, gathered requirements requiring solutions, with a cover letter asking for approval to proceed with the project, and resumes of team members participating in the project |  |  |  |  |  |  |
| Recognize when to or not to use an e-mail for communication |  |  |  |  |  |  |
| Demonstrate the ability to write a professional e-mail |  |  |  |  |  |  |

**Pathway Standards are described below. If your Information Technology Program uses the CIPs identified with the programs below, the foundational standards should be used as well as the specific pathway standards**

NETWORKING PATHWAY STANDARDS

CIP: 11.09010000

Use Information technology tools specific to the career cluster to access, manage, integrate and create information.

**FOUNDATION Standard 1:** Demonstrate an understanding of common operating systems used in the industry.

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Understand the history of operating systems and their progression |  |  |  |  |  |  |
| Understand basic commands of different systems |  |  |  |  |  |  |
| Understand the types of software used in business that runs on each operating system |  |  |  |  |  |  |
| Explain how the operating system should be configured to maximize performance |  |  |  |  |  |  |

**FOUNDATION Standard 2:** Use operating system principles to ensure optimal system function

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Apply appropriate file and disk management techniques |  |  |  |  |  |  |
| Employ desktop operating skills |  |  |  |  |  |  |
| Handle materials and equipment in a responsible manner |  |  |  |  |  |  |
| Follow power-up and log-on procedures |  |  |  |  |  |  |
| Interact with/respond to system messages using console device |  |  |  |  |  |  |
| Run applications/jobs in accordance with processing procedures |  |  |  |  |  |  |
| Follow log-off and power-down procedure(s) |  |  |  |  |  |  |

**FOUNDATION Standard 3:** List network devices and functions (e.g. repeater, bridge, switch, router)

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Define the difference between a router and a firewall |  |  |  |  |  |  |
| Define the difference between a hub and a switch |  |  |  |  |  |  |
| Define what a host intrusion prevention system does |  |  |  |  |  |  |
| Define what a network intrusion prevention system does |  |  |  |  |  |  |
| Define the difference between Intrusion Direction vs. Intrusion Prevention |  |  |  |  |  |  |
| Define the differences between a layer 2 and a layer 3 switch |  |  |  |  |  |  |

**FOUNDATION Standard 4:** Identify types of networks and their capabilities (e.g. LAN, WAN, MAN, Wi-Fi)

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate understanding of types of networks deployed in a home, small office, office buildings, schools, college campus, multi-site organizations and the primary difference between each |  |  |  |  |  |  |
| Demonstrate an understanding of the costs associated with each type of network and what drives the cost differences |  |  |  |  |  |  |
| Identify the different types of risks associated with each type of network |  |  |  |  |  |  |

**FOUNDATION Standard 5:** Summarize basic data communications components and trends to maintain and update IT systems

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| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| Explain data communications procedures, equipment and media a. Demonstrate knowledge of key communications procedures b. Demonstrate knowledge of the uses of data communication equipment c. Demonstrate knowledge of types of communications media |  |  |  |  |  |  |
| Explain data transmission of codes and protocols a. Demonstrate knowledge of data transmission codes and protocols |  |  |  |  |  |  |
| Summarize data communication trends and issues a. Identify data communication trends  b. Identify major current issues in data communications |  |  |  |  |  |  |

**FOUNDATION Standard 6:** Explain the importance of security of data (e.g. privacy of information, confidentiality, restricted use by authorized personnel)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| Demonstrate an awareness of technological advances and availability of resources |  |  |  |  |  |  |
| Understand the need for confidentiality |  |  |  |  |  |  |
| Identify sources of security problems with data |  |  |  |  |  |  |
| Identify methods of data protection |  |  |  |  |  |  |
| Understand the lifecycle of data protection (e.g. the creation of data, management of data, storage of data) |  |  |  |  |  |  |
| Understand the different methods to encrypt data (e.g. volume level encryption, file encryption, or database encryption) |  |  |  |  |  |  |

**FOUNDATION Standard 7:** Identify network topologies and protocols

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate knowledge of the OSI layers 1, 2, and 3 |  |  |  |  |  |  |
| Define what Internet Protocol is |  |  |  |  |  |  |
| Define what TCP is |  |  |  |  |  |  |
| Define what UDP is |  |  |  |  |  |  |
| Define what is a switched network vs. a hub network |  |  |  |  |  |  |
| Define what the difference is between Telnet and SSH |  |  |  |  |  |  |
| Define what the difference is between FTP and SFTP |  |  |  |  |  |  |

**FOUNDATION Standard 8:** Identify and list networking media

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Define what is RJ45 connection |  |  |  |  |  |  |
| Define what is a coax connection |  |  |  |  |  |  |
| Define the differences between cat 5, 5E and 6 |  |  |  |  |  |  |
| Define what a “point to point circuit” is and how that differs from the internet |  |  |  |  |  |  |
| Define what is the difference between Wi-Fi and leased line circuits |  |  |  |  |  |  |
| Define the difference between Wi-Fi and Satellite technology |  |  |  |  |  |  |

**FOUNDATION Standard 9:** Demonstrate technical knowledge of the Internet to develop and maintain IT systems

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Describe Internet protocols a. Demonstrate knowledge of the Transmission Control Protocol/Internet Protocol (TCP/IUP) suite b. Demonstrate knowledge of management protocols, applications and procedures (e.g., SNMP, intrusion detection, and reporting issues) c. Explain the concept of routing |  |  |  |  |  |  |
| Demonstrate a basic understanding of Domain Name System (DNS) |  |  |  |  |  |  |

**FOUNDATION Standard 10:** Access and use Internet services when completing IT related tasks to serve and update IT systems

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate the use of an Internet connection a. Configure a small home office Internet connection using cable, DSL, wireless or satellite connection b. Test Internet connection using tools such as ping, trace route, net stat, host, dig, and dnslookup |  |  |  |  |  |  |
| Troubleshoot Internet connection problems |  |  |  |  |  |  |
| Explain the components of Internet software a. Demonstrate knowledge of the components of Internet software |  |  |  |  |  |  |
| Install Internet software for use on an operating system a. Identify common browser features b. Install Internet software c. Differentiate between Web-based applications and applications installed on a local computer d. Download software upgrades and shareware from the Internet e. Unpack files using compression software |  |  |  |  |  |  |
| Describe virus protection procedures a. Demonstrate acute awareness of virus protection techniques b. Identify types and capabilities of popular virus protection software c. Explain spyware, adware, and malware d. Identify how to avoid spyware, adware, and malware and how to recover from infection |  |  |  |  |  |  |
| Explain cookies and adware on an Internet connected computer system a. Demonstrate knowledge of cookies and their use on an internet-connected computer system  b. Identify types and consequences of pop-ups and ad-ware |  |  |  |  |  |  |

**FOUNDATION Standard 11:** Install and configure software programs to maintain and update IT systems

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Verify that software to be installed is licensed prior to performing installation a. Verify conformance to licensing agreement b. Understand the concept of an End User License Agreement (EULA)  c. Differentiate between open source and proprietary licenses d. Explain the concept of open source e. Identify common characteristics of open source licensing agreements, including the GNU General Public License (GPL) |  |  |  |  |  |  |

**FOUNDATION Standard 12:** Recognize and analyze potential IT security threats to develop and maintain security requirements

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Describe potential security threats to information systems |  |  |  |  |  |  |
| Identify the range of security needs and the problems that can occur due to security lapses |  |  |  |  |  |  |
| Assess security threats a. Maximize threat reduction b. Assess exposure to security issues c. Implement countermeasures d. Ensure compliance with security rules, regulations, and codes e. Demonstrate knowledge of virus protection strategy f. Implement security procedures in accordance with business ethics |  |  |  |  |  |  |
| Develop plans to address security threats |  |  |  |  |  |  |
| Implement plans to address security procedures a. Maintain confidentiality b. Load virus detection and protection software c. Identify sources of virus infections d. Remove viruses e. Report viruses in compliance with company standards f. Implement backup and recovery procedures g. Follow disaster plan h. Provide for user authentication and restricted access (e.g. assign passwords, access level) |  |  |  |  |  |  |

PROGRAMMING AND SOFTWARE DEVELOPMENT PATHWAY STANDARDS

CIP: 11.02010000

Understand the concept of design, development, implementation and maintenance of computer software

**FOUNDATION Standard 1:** Demonstrate a fundamental understanding of programming

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Write a small modular program using variables |  |  |  |  |  |  |
| Describe a class and objects |  |  |  |  |  |  |
| Describe the key differences between procedural programming, object oriented programming, event driven programming and functional programming |  |  |  |  |  |  |
| List the key differences between a Waterfall life cycle and an Agile life cycle |  |  |  |  |  |  |

**FOUNDATION Standard 2:** Demonstrate the ability to design an application

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Gather data to identify customer requirements |  |  |  |  |  |  |
| Design a process map to illustrate a decision flow end to end |  |  |  |  |  |  |
| Demonstrate the ability to storyboard a user experience of the application |  |  |  |  |  |  |

**FOUNDATION Standard 3:** Demonstrate an understanding of how to create and develop software

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate the ability to code a program/application |  |  |  |  |  |  |
| Understand the difference between development, quality assurance and production |  |  |  |  |  |  |
| Demonstrate the ability to develop documentation and incorporate comments within the code |  |  |  |  |  |  |
| Develop a minimum viable product to obtain end-user feedback |  |  |  |  |  |  |
| User Peer Review to assess application code |  |  |  |  |  |  |

**FOUNDATION Standard 4:** Demonstrate the ability to test an application for functionality

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate the ability to edit for any invalid data/input |  |  |  |  |  |  |
| Demonstrate an application/program will run successfully with both valid and invalid data/input |  |  |  |  |  |  |
| Demonstrate the ability of the application to recover after invalid data has been input or processed (exception testing) |  |  |  |  |  |  |
| Explain the development of test data necessary to run tests on software |  |  |  |  |  |  |
| Apply test data to program code |  |  |  |  |  |  |
| Demonstrate knowledge of user acceptance testing |  |  |  |  |  |  |
| Develop end-user training plan and documentation |  |  |  |  |  |  |

**FOUNDATION Standard 5:** Understand the concepts regarding secure application design

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Research programming standards (i.e. OWASP) |  |  |  |  |  |  |
| Demonstrate knowledge of SQL injections |  |  |  |  |  |  |
| Demonstrate knowledge of cross-site scripting (XSS) |  |  |  |  |  |  |
| Demonstrate knowledge of how to intercept, capture and change HTML pages |  |  |  |  |  |  |

**FOUNDATION Standard 6:** Understand the concepts of version and change control

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate an understanding of Change Management |  |  |  |  |  |  |
| Research tools that are available to assist with version control and repositories |  |  |  |  |  |  |

**FOUNDATION Standard 7:** Understand the concepts of future improvements and upgrades to software

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Prioritize change requests |  |  |  |  |  |  |
| Explain the risks and benefits of incorporating changes into the existing code base |  |  |  |  |  |  |
| Develop a plan for ongoing maintenance and support |  |  |  |  |  |  |

INFORMATION SUPPORT AND SERVICES PATHWAY

CIP: 11.10060000000

Understand hardware and software support issues that affect a company

**FOUNDATION Standard 1:** Explain the cost of implementing day-to-day information support and services operations and how it affects the company’s bottom line

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Identify possible sources of data lost |  |  |  |  |  |  |
| Identify methods and technologies for preserving data |  |  |  |  |  |  |
| List the steps required for effective backup and recovery |  |  |  |  |  |  |
| Design a recovery plan for what happens if there is a disaster and how you would get everything back up and running |  |  |  |  |  |  |

**FOUNDATION Standard 2:** Explain the importance of backing up data and maintaining data integrity

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Identify possible sources of data lost |  |  |  |  |  |  |
| Identify methods and technologies for preserving data |  |  |  |  |  |  |
| List the steps required for effective backup and recovery |  |  |  |  |  |  |
| Design a recovery plan for what happens if there is a disaster and how you would get everything back up and running |  |  |  |  |  |  |

**FOUNDATION Standard 3:** Understand how changes that are made in one part of the system affects the others

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Explain the importance of preserving the privacy of data |  |  |  |  |  |  |
| Predict how changes to one area might impact another area |  |  |  |  |  |  |
| Understand the concept of regression testing |  |  |  |  |  |  |

**FOUNDATION Standard 4:** Explain the importance of security of data (e.g. privacy of information, confidentiality, encryption, and restricted access by authorized personnel)

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate an awareness of technological advances in securing data |  |  |  |  |  |  |
| Understand the requirement for confidentiality |  |  |  |  |  |  |
| Identify methods of data protection |  |  |  |  |  |  |
| Understand the importance of user roles |  |  |  |  |  |  |
| Explain the difference between Admin and non-Admin roles |  |  |  |  |  |  |

**FOUNDATION Standard 5:** Understand best practices in regards to Cyber Security

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Explain why hacks happen |  |  |  |  |  |  |
| Understand the consequences of Cyber Security breaches |  |  |  |  |  |  |
| Understand the tools available to minimize the risks for Cyber Security breaches |  |  |  |  |  |  |
| Explain a process that could be used in response to a breach |  |  |  |  |  |  |

**FOUNDATION Standard 6:** Be able to install and support applications commonly used in the district

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Understand how to install applications |  |  |  |  |  |  |
| Understand the difference between network installations and local installations |  |  |  |  |  |  |
| Understand Cloud based applications and how they differ from local applications |  |  |  |  |  |  |

**FOUNDATION Standard 7:** Demonstrate effective customer services skills (e.g. patience, courtesy, identify customer expectations, promptness.

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Role play customer help-desk scenarios |  |  |  |  |  |  |
| Understand the importance of a positive attitude |  |  |  |  |  |  |
| Understand the different types of personalities and how to communicate with each |  |  |  |  |  |  |
| Explore the support ticket systems available for use by help desks |  |  |  |  |  |  |
| Demonstrate a conflict-resolution strategy to de-escalate an unsatisfied customer |  |  |  |  |  |  |

**FOUNDATION Standard 8:** Demonstrate the ability to convey information regarding technical material (non-technical explanations for technical terms)

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Explain clearly the instructions for a computer task to another individual |  |  |  |  |  |  |
| Conduct task specific training and coach others to apply related concepts |  |  |  |  |  |  |
| Demonstrate ability to train others to use common applications |  |  |  |  |  |  |
| Demonstrate ability to document a process or solution |  |  |  |  |  |  |

WEB AND DIGITAL COMMUNICATIONS

**(WEB DESIGN)**

CIP: 11.08010000

Careers in Web and Digital Communications involve creating, designing and producing interactive multimedia products and services, including development of digitally-generated or computer-enhanced media used in business, training, entertainment, communications and marketing.

**FOUNDATION Standard 1:** Iterate through the desk and development process to create a uniform Web/digital product

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Participate in iterative development with clients and team members   1. Manage the change control process 2. Identify and track critical milestones 3. Report project status 4. Identify optimal strategies for successful interactions with clients and team members |  |  |  |  |  |  |

**FOUNDATION Standard 2:** Participate in a user focused design and development process to produce Web and digital communications solutionss

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Analyze usability and accessibility as it pertains to customer needs   1. Demonstrate knowledge of 508 ADA Compliance 2. Demonstrate knowledge of web metrics and governance (policies and stylebooks) 3. Demonstrate knowledge of cultural implications on design and deployment of digital communication products 4. Engage in user testing throughout the design and development process |  |  |  |  |  |  |

**FOUNDATION Standard 3:** Design and employ the use of graphics to create a visual Web/Digital design

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Implement functional design criteria   1. Identify, utilize and create reusable components 2. Create and produce content 3. Create and refine design concepts |  |  |  |  |  |  |
| Create product visual design   1. Apply principles and elements of design 2. Apply color theory to select appropriate colors 3. Create and/or implement the look and feel of the product 4. Create graphical images and videos 5. Apply knowledge of typography 6. Alter digitized images using an image manipulation program 7. Evaluate visual appeal |  |  |  |  |  |  |

**FOUNDATION Standard 4:** Gather and analyze digital communication customer requirements to best meet consumer needs

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Gather data to identify customer requirements   1. Gather information using interviewing strategies 2. Determine client’s needs and expected outcomes |  |  |  |  |  |  |
| Collect requirements data from customers and competing Web sites   1. Determine purpose of the digital communication project 2. Determine the target audience 3. Determine the digital communication elements to be used 4. Determine client’s privacy policy and expectations |  |  |  |  |  |  |
| Evaluate requirements data that has been collected |  |  |  |  |  |  |
| Demonstrate how to create and receive approval for a Web Site Plan |  |  |  |  |  |  |
| Convey technical concepts form Web design to a non-technical audience |  |  |  |  |  |  |

**FOUNDATION Standard 5:** Define the scope of digital communication work in a written form to summarize and meet customer requirements

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Define scope of work to meet customer requirements   1. Develop a design brief 2. Determine the target audience requirements (such as web accessibility) 3. Identify available media and content sources 4. Develop time line for completion 5. Determine staffing resources – internal and external – required to complete project 6. Develop preliminary project budget 7. Write document 8. Obtain client approval on scope of work |  |  |  |  |  |  |

**FOUNDATION Standard 6:** Prepare digital communication product specifications to communicate specifications with various audiences

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Prepare functional specifications   1. Develop flowchart/navigational blueprints 2. Develop storyboards 3. Determine delivery platform(s) 4. Design user interface 5. Design navigational schema |  |  |  |  |  |  |
| Prepare visual design specifications   1. Apply principles of design (color theory and schemes, proximity, alignment, repetition, web graphics, optimization, typography) 2. Identify technical constraints 3. Create sample design showing placement of content, buttons, graphics and suggested color scheme |  |  |  |  |  |  |
| Create final project plan   1. Identify and obtain tools and resources to do the job 2. Identify and evaluate risks 3. Develop detailed task list 4. Identify critical milestones 5. Identify interdependencies |  |  |  |  |  |  |

**FOUNDATION Standard 7:** Demonstrate the effective use of tools for digital communication production, development and project management to complete web/digital communication project(s)

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Select and use appropriate software tools   1. Demonstrate proficiency in use of digital imaging, digital video techniques, and equipment 2. Demonstrate knowledge of available graphics, video, motion graphics, web software programs 3. Demonstrate knowledge of available project management and collaborative tools 4. Demonstrate knowledge of integrated development environments 5. Demonstrate use of image altering software 6. Identify how different user agents (browsers, devices) affect the digital communication product |  |  |  |  |  |  |

**FOUNDATION Standard 8:** Employ knowledge of web design, programming and administration develop and maintain Web Applications

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Implement functional design criteria   1. Identify, utilize and create reusable components 2. Create and produce content 3. Create and refine design concepts |  |  |  |  |  |  |
| Create product visual design   1. Apply principles and elements of design 2. Apply color theory to select appropriate colors 3. Create and/or implement the look and feel of the product 4. Create graphical images and/or video elements 5. Apply knowledge of typography 6. Alter digitized images using an image manipulation program 7. Evaluate visual appeal |  |  |  |  |  |  |

| Use basic Web development skills   1. Demonstrate knowledge of HTM and CSS 2. Demonstrate knowledge of version control and why it is important 3. Demonstrate knowledge of basic web application security 4. Demonstrate that website meets the validation process and is compatible across multiple browsers and devices |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Summarize Internet architecture elements   1. Demonstrate knowledge of transfer protocols (FTP, WebDav) 2. Demonstrate knowledge of Internet standards bodies 3. Keep up-to-date with new and emerging trends related to the Internet |  |  |  |  |  |  |
| Employ basic Web programming knowledge   1. Demonstrate knowledge of client-side processing and its advantages/disadvantages 2. Identify standards scripting languages such as JavaScript 3. Demonstrate knowledge of website testing 4. Demonstrate knowledge of the uses and advantages/disadvantages of various scripting languages |  |  |  |  |  |  |

**FOUNDATION Standard 9:** Test a digital communication product to evaluate its functionality

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Develop a test plan for the digital communication product   1. Perform usability tests 2. Assess product effectiveness 3. Test product for reliability 4. Plan and coordinate customer acceptance testing |  |  |  |  |  |  |

| Implement a test plan for the digital communication product   1. Define the problem 2. Identify/test possible solutions 3. Develop resolution plan 4. Implement solution 5. Evaluate problem-solving processes and outcomes |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Resolve product problems |  |  |  |  |  |  |

**FOUNDATION Standard 10:** Consider intellectual property issues when creating Web pages

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Explain the concept of intellectual property |  |  |  |  |  |  |
| Differentiate between copyright and trademarks |  |  |  |  |  |  |
| Describe the function of non-disclosure agreement (NDA) |  |  |  |  |  |  |

WEB AND DIGITAL COMMUNICATIONS

**(GRAPHIC ARTS)**

CIP: 11.08030000

**FOUNDATION Standard 1:** Demonstrate knowledge of the Graphics Industry

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate knowledge of the history of the graphic design field  a. Research technologies that advanced graphic design   1. Describe past, present, and future styles in the graphic design field 2. Identify art movements that impacted graphic arts 3. Describe the importance of graphic design’s influence on society 4. Identify factors that contribute to the success of media businesses and freelance/contract providers 5. Examine how the relationship among marketing, sales and production affects profitability |  |  |  |  |  |  |
| Communicate ideas using appropriate industry terminology   1. Formulate written and verbal communications using industry standard terms 2. Prepare and deliver a visual presentation utilizing appropriate cluster knowledge |  |  |  |  |  |  |

**FOUNDATION Standard 2:** Apply elements and principles of design to communicate visually

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Utilize computer applications to manage media   1. Use appropriate electronic publishing software and output devices 2. Apply essential commands and knowledge of computer operating systems 3. Apply computer file management techniques 4. Use the internet for file transfer 5. Select the format for digital delivery 6. Use and care for equipment and related accessories 7. Describe the functionality of the internet, intranet, and extranet in the media environment 8. Explain the methods of protecting a computer against computer threats |  |  |  |  |  |  |
| Apply knowledge of data capture and manipulations   1. Identify software that supports data capture for media devices (i.e. digital camera, video input device, graphics tablet, graphics expansion boards) 2. Select appropriate resolutions for data capture 3. Capture and transfer still image, audio, and moving image content 4. Archive and manage data for media applications |  |  |  |  |  |  |

| Identify and apply the elements of design   1. Identify the principles of balance, contrast, alignment, rhythm, repetition, movement, harmony, emphasis, and unity in samples of graphic works 2. Incorporate principles of balance, contrast, alignment, rhythm, repetition, movement, harmony, emphasis and unity in student generated works. 3. Demonstrate the principles of design through various drawing techniques |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Identify and apply the principles of design   1. Analyze the principles of balance, contrast alignment, rhythm, repetition, movement, harmony, emphasis, and unity in samples of graphic works 2. Incorporate principles of balance, contrast, alignment, rhythm, repetition, movement, harmony, emphasis and unity in student-generated graphic works 3. Demonstrate the principles of design through various drawing techniques |  |  |  |  |  |  |
| Identify and apply the principles of typography   1. Identify the anatomical components and qualities of type (i.e. x-height, ascenders, descenders, counters, etc. 2. Apply and adjust formatting to type 3. Construct graphic works utilizing and manipulating type |  |  |  |  |  |  |
| Apply principles and elements of design to layout   1. Apply effective use of negative space composition, message structure, graphics, etc. to graphic works 2. Create graphic works utilizing grids 3. Create graphic works utilizing templates 4. Demonstrate layout skills for print collaterals (i.e. business cards, newspapers, packaging, etc.) 5. Demonstrate layout skills for digital media 6. Explain the importance of consistency of design 7. Explain the importance of usability 8. Explain the importance of core messaging 9. Apply measurement tools and ratio analysis to image positioning in graphic works 10. Solve aspect ratio proportion measurement in video and animation development |  |  |  |  |  |  |

**FOUNDATION Standard 3:** Demonstrate knowledge of the key aspects of production using industry standard software

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate knowledge of concept development   1. Generate project ideas through the use of thumbnails, roughs, mock-ups, wireframes, etc. 2. Create a storyboard for a project |  |  |  |  |  |  |

| Demonstrate knowledge of image creation and manipulation   1. Analyze differences and appropriate applications of vector-based and bitmap images 2. Use a variety of input devices to import photos, images, and other content 3. Incorporate the use of image manipulation and illustration software into final products 4. Apply nondestructive image editing techniques such as layering and masking 5. Practice using different selection tools and techniques to manipulate images 6. Practice in-camera composition and cropping |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate applications of media outputs   1. Use appropriate resolution, compression, and file formats for various media outputs including web, video, and print 2. Incorporate appropriate color modes in graphic works including but not limited to RGB and CMYK |  |  |  |  |  |  |
| Demonstrate knowledge of the graphic design workflow to increase success and productivity   1. Develop a workflow for a project 2. Synthesize information collected from communications with various stakeholders 3. Describe project management 4. Create projects that define core message 5. Work in a team to plan a larger project 6. Identify the target audience for a project |  |  |  |  |  |  |
| Identify and apply the design process   1. Explain the design process 2. Apply the design process to generate graphic works |  |  |  |  |  |  |
| Demonstrate knowledge of branding and corporate identity   1. Analyze branding and corporate identity, its purpose and constituents 2. Create a visual that contains all the richness of the brand |  |  |  |  |  |  |

**FOUNDATION Standard 4:** Demonstrate knowledge of ethical and legal issues related to graphic design

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Demonstrate knowledge of copyright and intellectual property law   1. Research laws governing copyright, intellectual property (including font usage, photography, illustration, audio and video rights), and software licensing 2. Research laws governing brand issues, trademark, and other proprietary rights) 3. Discuss consequences of violating copyright, privacy, and data security laws 4. Define and debate fair use including authorships, rights of use for work and likeness, and credit lines 5. Model fair use in production of graphic works 6. Describe how diversity (cultural, ethnic, multigenerational) and ethics affect the selectin of projects and programs |  |  |  |  |  |  |
| Demonstrate knowledge of ethical behavior as it relates to the industry   1. Research and discuss censorship as it applies to the graphic design industry 2. Research the purpose of non-disclosure agreements (NDA) 3. Incorporate cultural sensitivity and diversity awareness into the design process 4. Debate legal versus ethical behaviors 5. Incorporate ethical behaviors in graphic projects |  |  |  |  |  |  |

**FOUNDATION Standard 5:** Create and maintain a personal portfolio

| **Standards & Competencies** | **Course 1** | **Course 2** | **Course 3** | **Course 4** | **Course 5** | **Course 6** |
| --- | --- | --- | --- | --- | --- | --- |
| Research and compare the various types of personal portfolios |  |  |  |  |  |  |
| Develop graphics portfolios that include traditional and digital works |  |  |  |  |  |  |
| Recognize that portfolios are dynamic and require maintenance |  |  |  |  |  |  |
| Demonstrate the process of evaluating portfolios   1. Conduct peer and self-evaluations using rubrics 2. Understand the elements of the critique process, including a respect for peer work and the ability to give and receive dispassionate criticism |  |  |  |  |  |  |