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| Strand | 2. IT Fundamentals |
| Description | Learners apply fundamental principles of IT, including the history of IT and its impact on society, common industry terms, systems theory, information storage and retrieval, database management, and computer hardware, software, and peripheral device configuration and installation. This base of knowledge and skills may be applied across the career field. |
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| **Outcome** | 2.4.       Emerging Technologies: Identify trending technologies, their fundamental architecture, and their value in the marketplace. |
| **Competencies** | 2.4.1.       Investigate the scope and the impact of mobile computing environments on society. |
| 2.4.2.       Describe the differences, advantages, and limitations of cloud computing (e.g., public cloud, private cloud, hybrid cloud) and on-premises computing. |
| 2.4.3.       Utilize cloud computing applications (e.g. services, applications, virtual environments). |
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| **Outcome** | 2.7.       Web Architecture: Explain the fundamentals of delivering information and applications using web architecture. |
| **Competencies** | 2.7.1.       Describe methods of securely transmitting data. |
| 2.7.2.       Describe ways to present data (e.g., mobile applications, desktop applications, web applications). |
| 2.7.3.       Differentiate between a client and a server. |
| 2.7.4.       Identify how the use of different browsers and devices affects the look of a webpage. |
| 2.7.5.       Explain the relationship between data transmission volumes, bandwidth, and latency. |
| 2.7.6.       Describe the characteristics and use of browser plug-ins. |
| 2.7.7.       Compare the advantages and disadvantages of running an in-house server or using a service provider. |
| 2.7.8.       Describe the difference between static and dynamic sites and the reasons for using each. |
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| **Outcome** | 2.9.       Project Concept Proposal: Develop a project concept proposal. |
| **Competencies** | 2.9.1.       Identify and incorporate branding strategies. |
| 2.9.2.       Determine the scope and purpose of the project. |
| 2.9.3.       Determine the target audience, client needs, expected outcomes, objectives, and budget. |
| 2.9.4.       Develop a conceptual model and design brief for the project. |
| 2.9.5.       Develop a timeline, communication plan, task breakdown, costs (e.g., equipment, labor), deliverables, and responsibilities for completion. |
| 2.9.6.       Develop and present a comprehensive proposal to stakeholders. |
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| **Outcome** | 2.10.   Equipment: Select, operate, and maintain equipment. |
| **Competencies** | 2.10.1.    Identify hardware platforms, configurations, and support models. |
| 2.10.2.    Identify processor, memory, and storage requirements. |
| 2.10.3.    Identify architecture requirements. |
| 2.10.4.    Identify software application requirements. |
| 2.10.5.    Prepare and operate equipment per project design specifications. |
| 2.10.6.    Monitor equipment operation and troubleshoot issues and problems. |
| 2.10.7.    Backup, archive, and manage data. |
| 2.10.8.    Prepare equipment for storage or decommissioning. |
| 2.10.9.    Perform routine maintenance per manufacturer specifications. |
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| **Outcome** | 2.11.   Troubleshooting: Select and apply troubleshooting methodologies for problem solving. |
| **Competencies** | 2.11.1.    Identify the problem. |
| 2.11.2.    Select troubleshooting methodology (e.g., top down, bottom up, follow the path, spot the differences). |
| 2.11.3.    Investigate symptoms based on the selected methodology. |
| 2.11.4.    Gather and analyze data about the problem. |
| 2.11.5.    Design a solution. |
| 2.11.6.    Test a solution. |
| 2.11.7.    Implement a solution. |
| 2.11.8.    Document the problem and the verified solution. |
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| **Outcome** | 2.12.   Performance Tests and Acceptance Plans: Develop performance tests and acceptance plans. |
| **Competencies** | 2.12.1.    Create a written procedure agreed by the stakeholders and project team for determining the acceptability of the project deliverables. |
| 2.12.2.    Develop a test system that accurately mimics external interfaces. |
| 2.12.3.    Develop test cases that are realistic, compare with expected performance, and include targeted platforms and device types. |
| 2.12.4.    Develop, perform, and document usability and testing integration. |
| 2.12.5.    Make corrections indicated by test results. |
| 2.12.6.    Seek stakeholder acceptance upon successful completion of the test plan. |
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| **Outcome** | 2.13.    Rollout and Handoff: Plan rollout and facilitate handoff to customer. |
| **Competencies** | 2.13.1.    Include overall project goals and timelines in the rollout plan. |
| 2.13.2.    Communicate rollout plans to key stakeholders in a timely manner. |
| 2.13.3.    Conduct final review and approvals according to company standards. |
| 2.13.4.    Identify support staff, training needs, and contingency plans in the rollout plan. |
| 2.13.5.    Test delivered application to assure that it is fully functional for the customer or user and meets all requirements. |
| 2.13.6.    Deliver support and training materials. |
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| Strand | 6. Web Development |
| Description | Learners apply principles of design and technology, including programming standards and protocols, to create, test, host, and maintain webpages and websites with text, graphics, multimedia, scripting, linking, and data integration in a structure that is easy to navigate and accessible for all users via a variety of hardware and software platforms.  |
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| **Outcome** | 6.1.       Webpages: Create basic webpages. |
| **Competencies** | 6.1.1.       Describe the basic principles of Hypertext Markup Language (HTML) and its functional relationship with web browsers. |
| 6.1.2.       Plan a webpage considering subject, devices, audience, layout, color, links, graphics, and Americans with Disabilities Act (ADA) requirements. |
| 6.1.3.       Format the text of a webpage in a WYSIWYG (What You See Is What You Get) editor and in a text editor using HTML formatting tags (e.g., hyperlink, e-mail, table formatting, graphic attributes). |
| 6.1.4.       Use writing process techniques (i.e., drafting, revising, editing, proofreading) to check the webpage for format and text accuracy. |
| 6.1.5.       Create and format ordered and unordered lists on a webpage using HTML list formatting tags. |
| 6.1.6.       Create and format a table in a webpage using HTML table formatting tags and attributes. |
| 6.1.7.       Integrate styles (e.g., inline or external Cascading Style Sheets [CSS]). |
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| **Outcome** | 6.2.       Links and Multimedia: Add links to a webpage and insert multimedia files. |
| **Competencies** | 6.2.1.       Create absolute links and relative links. |
| 6.2.2.       Write a Hypertext Markup Language (HTML) anchor that links to another section of the same webpage. |
| 6.2.3.       Create hyperlinks that send e-mail messages and download files. |
| 6.2.4.       Insert image and wrap text around the image using Cascading Style Sheets (CSS). |
| 6.2.5.       Resize a graphic image in a webpage using CSS. |
| 6.2.6.       Insert audio and video files into a webpage using HTML tags. |
| 6.2.7.       Build a hover or mouseover effect to change the style of a link. |
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| Strand | 7. Digital Media |
| Description | Learners apply principles of digital media to produce interactive media; develop and produce multimedia applications; integrate typography into media; create 3D models and 2D and 3D animation; and create digital video, audio, and photographs. |
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| **Outcome** | 7.1.       Interactive Media: Describe and explain interactive media and interactive media production. |
| **Competencies** | 7.1.1.       Identify the types and uses of interactive media environments (e.g., web-based, kiosks, games, mobile devices, video, print). |
| 7.1.2.       Describe the components of interactive media. |
| 7.1.3.       Identify the major characteristics of interactive media presentations. |
| 7.1.4.       Identify important historical developments and future trends in interactive media. |
| 7.1.5.       Identify the major interactive media genres. |
| 7.1.6.       Perform critical review of interactive media products in different genres. |
| 7.1.7.       Identify the intellectual property rights, responsibilities, and controls related to interactive media. |
| 7.1.8.       Analyze the social and cultural implications of interactive media. |
| 7.1.9.       Identify major applications for interactive media (e.g., sales and marketing, interactive advertising, education, corporate training, corporate communications, distance learning, news, entertainment). |
| 7.1.10.    Identify specific uses for interactive media in each potential market. |
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| **Outcome** | 7.2.       Multimedia Tools: Develop navigational structures, scripts, storyboards, and flowcharts for multimedia applications. |
| **Competencies** | 7.2.1.       Choose a navigational menu structure (e.g., rollovers, drop-downs, disjointed). |
| 7.2.2.       Construct and place navigational units. |
| 7.2.3.       Build in interactive elements. |
| 7.2.4.       Determine uses and needs for site maps, multimedia scripts, storyboards, and flowcharts. |
| 7.2.5.       Make preliminary sketches showing placement of images and text on screen. |
| 7.2.6.       Show placement of buttons and navigational graphics. |
| 7.2.7.       Provide information on color schemes. |
| 7.2.8.       Describe music, video, and special effects to be used. |
| 7.2.9.       Provide a sample layout to stakeholders for review. |
| 7.2.10.    Select and create visual design elements appropriate for the intended audience and use. |
| 7.2.11.    Develop characters and narrative to support intended outcomes. |
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| **Outcome** | 7.3.       Production: Produce interactive media. |
| **Competencies** | 7.3.1.       Select the media elements to be used (e.g., sound, video, graphics, text, animation). |
| 7.3.2.       Generate text for multi-image presentations (e.g., title graphics, charts, graphs). |
| 7.3.3.       Incorporate graphics (e.g., digital, hand-drawn, photographic). |
| 7.3.4.       Incorporate computer animation. |
| 7.3.5.       Prepare and integrate photographic images and special effects with graphic images. |
| 7.3.6.       Incorporate video footage. |
| 7.3.7.       Edit video footage. |
| 7.3.8.       Record and/or acquire sound tracks (e.g., narrative, voiceover, sound effects, music). |
| 7.3.9.       Integrate sound with visuals. |
| 7.3.10.    Produce, test, debug, and archive a final product. |
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| **Outcome** | 7.4.       Graphics: Construct and manipulate digital graphics. |
| **Competencies** | 7.4.1.       Identify the purpose and intended audience of graphics. |
| 7.4.2.       Select color, shape, size, and texture of objects. |
| 7.4.3.       Create or acquire graphics. |
| 7.4.4.       Manipulate and layer objects. |
| 7.4.5.       Differentiate between vector and raster images. |
| 7.4.6.       Select an appropriate graphic file format and resolution. |
| 7.4.7.       Optimize and export graphics files for intended use. |
| 7.4.8.       Select graphic software applications. |
| 7.4.9.       Manipulate graphic objects. |
| 7.4.10.    Compress and decompress graphic files. |
| 7.4.11.    Describe and select color profiles (e.g., Red Green Blue [RGB], Cyan Magenta Yellow Key [CMYK], Pantone) |
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| **Outcome** | 7.5.       Typography: Integrate typography in media. |
| **Competencies** | 7.5.1.       Identify typographic measurements (e.g., picas, points, pixels, ems). |
| 7.5.2.       Mix families of type within a project. |
| 7.5.3.       Select appropriate kerning, leading, tracking, and other related formatting. |
| 7.5.4.       Identify appropriate typefaces (e.g., serif, sans serif, Web Safe, screen, print). |
| 7.5.5.       Prepare a type style guide. |
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| **Outcome** | 7.9.       Photographs: Create photographs. |
| **Competencies** | 7.9.1.       Select and set up lighting needed (e.g., electronic flash units, reflectors, bounce, spot, daylight). |
| 7.9.2.       Select a digital file format or film format and camera. |
| 7.9.3.       Select and attach lenses (e.g., wide-angle, telephoto, zoom) and filters (e.g., color-compensating, polarizing, special effects). |
| 7.9.4.       Determine composition, formal qualities, scale, and use of space. |
| 7.9.5.       Shoot photographs. |
| 7.9.6.       Edit photographs (e.g., color corrections, cropping, enhancements). |