

Career & Technical Education | Information Technology

Design Techniques

Subject Code: 145095

Outcome & Competency Descriptions

Course Description:

Students will learn techniques for transforming photographic images, through use of digital cameras, computers, and mobile devices. To accomplish this, they will learn software photo editing techniques including layering, color correction, masking, and special effects using current commercial and opensource programs and applications.

Strand 1. Business Operations/21st Century Skills

Learners apply principles of economics, business management, marketing, and employability in an entrepreneur, manager, and employee role to the leadership, planning, developing, and analyzing of business enterprises related to the career field.

Outcome: 1.3. Business Ethics and Law

Analyze how professional, ethical, and legal behavior contributes to continuous improvement in organizational performance and regulatory compliance.

Competencies

- 1.3.2. Follow protocols and practices necessary to maintain a clean, safe, and healthy work environment.
- 1.3.5. Access and implement safety compliance measures (e.g., quality assurance information, safety data sheets [SDSs], product safety data sheets [PSDSs], United States Environmental Protection Agency [EPA], United States Occupational Safety and Health Administration [OSHA]) that contribute to the continuous improvement of the organization.
- 1.3.6. Identify deceptive practices (e.g., bait and switch, identity theft, unlawful door-to-door sales, deceptive service estimates, fraudulent misrepresentations) and their overall impact on organizational performance.
- 1.3.8. Verify compliance with computer and intellectual property laws and regulations.

Outcome: 1.4. Knowledge Management and Information Technology

Demonstrate current and emerging strategies and technologies used to collect, analyze, record, and share information in business operations.

Competencies

- 1.4.1. Use office equipment to communicate (e.g., phone, radio equipment, fax machine, scanner, public address systems).

Outcome: 1.5. Global Environment

Evaluate how beliefs, values, attitudes and behaviors influence organizational strategies and goals.

Competencies

- 1.5.7. Use intercultural communication skills to exchange ideas and create meaning.

Outcome: 1.7. Entrepreneurship / Entrepreneurs

Analyze the environment in which a business operates, and the economic factors and opportunities associated with self-employment.

Competencies

- 1.7.5. Develop a business plan.
- 1.7.13. Protect intellectual property and knowledge (e.g., copyright, patent, trademark, trade secrets, processes).

Outcome: 1.8. Operations Management

Plan, organize and monitor an organization or department to maximize contribution to organizational goals and objectives.

Competencies

- 1.8.1. Forecast future resources and budgetary needs using financial documents (e.g., balance sheet demand forecasting, financial ratios).
- 1.8.2. Select and organize resources to develop a product or a service.
- 1.8.3. Analyze the performance of organizational activities and reallocate resources to achieve established goals.
- 1.8.4. Identify alternative actions to take when goals are not met (e.g., changing goals, changing strategies, efficiencies).
- 1.8.8. Identify routine activities for maintaining business facilities and equipment.
- 1.8.9. Develop a budget that reflects the strategies and goals of the organization.

Outcome: 1.9. Financial Management

Use financial tools, strategies and systems to develop, monitor and control the use of financial resources to ensure personal and business financial well-being.

Competencies

- 1.9.1. Create, analyze and interpret financial documents (e.g., budgets, income statements).
- 1.9.2. Identify tax obligations.
- 1.9.3. Review and summarize savings, investment strategies and purchasing options (e.g., cash, lease, finance, stocks, bonds).
- 1.9.4. Identify credit types and their uses in order to establish credit.
- 1.9.5. Identify ways to avoid or correct debt problems.
- 1.9.8. Identify income sources and expenditures.

Outcome: 1.10. Sales and Marketing

Manage pricing, place, promotion, packaging, positioning and public relations to improve quality customer service.

Competencies

- 1.10.2 Determine the customer's needs and identify solutions.
- 1.10.5 Monitor customer expectations and determine product/services satisfaction by using measurement tools.
- 1.10.6 Discuss the importance of correct pricing to support a product or service's positioning in the marketing mix.
- 1.10.7 Describe the importance and diversity of distribution channels (i.e., direct, indirect) to sell a product.
- 1.10.10 Demonstrate sales techniques.

Strand 2. IT Fundamentals

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.

Outcome: 2.9. Project Concept Proposal

Develop a project concept proposal.

Competencies

- 2.9.1. Identify the scope and purpose of branding.
- 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, a communication plan, a task breakdown, costs (e.g., equipment, labor), deliverables, and responsibilities for completion.
- 2.9.6. Develop and present a comprehensive proposal to stakeholders.

Outcome: 2.10. Equipment

Select, prepare, operate, and maintain equipment.

Competencies

- 2.10.1. Identify hardware platforms, configurations, and support models.
- 2.10.4. Identify software application requirements.

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.

Outcome: 2.12. Performance Tests and Acceptance

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.

Outcome: 2.13. Rollout and Handoff

Plan rollout and facilitate handoff to customers.

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.

Outcome: 2.14. Artificial Intelligence

Understand and apply prescribed methods of using Artificial Intelligence.

Competencies

- 2.14.1. Describe how machine learning and neural networks operate differently than standard decision trees.
- 2.14.2. Analyze how artificial intelligence technology impacts society and the ethical implications of its usage.
- 2.14.3. Write and revise a prompt to generate the desired response from an AI.
- 2.14.4. Evaluate the result of an AI query on a variety of parameters (e.g. validity, relevance, authenticity, potential bias and hallucinations).
- 2.14.6. Critically analyze scenarios involving AI usage.

Outcome: 2.15. UX/UI Design

Develop basic skills and knowledge of the UX/UI Design Process.

Competencies

- 2.15.1. Understand the UX/UI design process (e.g. vision, journey mapping, wireframing, prototyping, strategizing) for the targeted platform (e.g. graphics, applications, programming).

Strand 7. Digital Media

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.

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, online learning, corporate training, corporate communications, news, entertainment).
- 7.1.10. Identify specific uses for interactive media in potential markets.

Outcome: 7.2. Multimedia Tools

Develop navigational structures, scripts, storyboards, and flowcharts for multimedia applications.

Competencies

- 7.2.5. Make preliminary sketches showing placement of images and text on screen.
- 7.2.6. Place buttons and navigational graphics.
- 7.2.7. Select colors based on color theory and psychology.
- 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 client personas and narratives for intended project outcomes.

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 soundtracks (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.
- 7.3.11. Apply accessibility guidelines to the selection and production of interactive media.

Outcome: 7.4. Graphics

Construct and manipulate digital graphics.

Competencies

- 7.4.1. Select and manipulate color profiles (e.g., Red Green Blue [RGB], Cyan Magenta Yellow Key [CMYK], Pantone) for appropriate uses.
- 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 graphic software applications based on budget, technical capabilities and hardware specifications to meet intended project outcome.
- 7.4.7. Optimize and export graphics files for intended use.
- 7.4.8. Manipulate graphic objects.
- 7.4.9. Compress and decompress graphic files.
- 7.4.10. Describe and select color profiles (e.g., Red Green Blue [RGB], Cyan Magenta Yellow Key [CMYK], Pantone).

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.

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 appropriate camera or device.
- 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. Use International Standards Organization (ISO), shutter speed, aperture, and white balance settings to shoot manual photographs.
- 7.9.6. Edit photographs (e.g., color corrections, cropping, enhancements).
- 7.9.7. Identify differences between film photographs and digital images.