



Digital Arts & Design III

Primary Career Cluster:	Arts, A/V Technology, & Communications
Course Contact:	CTE.Standards@tn.gov
Course Code(s):	C11H16
Prerequisite(s):	<i>Digital Arts & Design II</i> (C11H05)
Credit:	1-2 (See Recommended Credits Below)
Grade Level:	11-12
Focus Elective Graduation Requirements:	This course satisfies one to two of three credits required for an elective focus when taken in conjunction with other <i>Arts, A/V Technology, & Communications</i> courses.
Program of Study (POS) Concentrator:	This course satisfies one out of two required courses that meet the Perkins V concentrator definition, when taken in sequence in the approved program of study.
Programs of Study and Sequence:	This is the third course in the <i>Digital Arts & Design</i> program of study.
Aligned Student Organization(s):	SkillsUSA: http://www.skillsusatn.org/ Technology Student Association (TSA): http://www.tntsa.org
Coordinating Work-Based Learning:	Teachers are encouraged to use embedded WBL activities such as informational interviewing, job shadowing, and career mentoring. For information, visit https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html .
Promoted Tennessee Student Industry Credentials:	Credentials are aligned with post-secondary and employment opportunities and with the competencies and skills that students acquire through their selected program of study. For a listing of promoted student industry credentials, visit https://www.tn.gov/content/tn/education/educators/career-and-technical-education/student-industry-certification.html .
Teacher Endorsement(s):	153, 230, 311, 435, 436, 475, 476, 516, 519, 520, 521, 537, 538, 543, 576, 583, 597, 710, 711, 953
Required Teacher Certifications/Training:	ADDA Certified Digital Designer or NOCTI Advertising & Design or Adobe Certified Expert
Teacher Resources:	https://www.tn.gov/education/educators/career-and-technical-education/career-clusters/cte-cluster-arts-av-tech.html Best For All Central: https://bestforall.tnedu.gov/

Course at a Glance

CTE courses provide students with an opportunity to develop specific academic, technical, and 21st century skills necessary to be successful in career and in life. In pursuit of ensuring every student in Tennessee achieves this level of success, we begin with rigorous course standards which feed into intentionally designed programs of study.

Students engage in industry relevant content through general education integration and experiences such as career and technical student organizations (CTSO) and work-based learning (WBL). Through these experiences, students are immersed with industry standard content and technology, solve industry-based problems, meaningfully interact with industry professionals, and use/produce industry specific, informational texts.

Using a Career and Technical Student Organization (CTSO) in Your Classroom

CTSOs are a great resource to put classroom learning into real-life experiences for your students through classroom, regional, state, and national competitions, and leadership opportunities. Below are CTSO connections for this course, note this is not an exhaustive list.

- Participate in CTSO Fall Leadership Conference to engage with peers by demonstrating logical thought processes and developing industry specific skills that involve teamwork and project management.
- Participate in contests that highlight job skill demonstration, interviewing skills, community service activities, extemporaneous speaking, and job interview.
- Participate in leadership activities such as Student2Student Mentoring, National Week of Service, Officer Training, and Community Action Project.

For more ideas and information, visit Tennessee SkillsUSA at <http://www.skillsusatn.org/>.

Using Work-Based Learning (WBL) in Your Classroom

Sustained and coordinated activities that relate to the course content are the key to successful work-based learning. Possible activities for this course include the following. This is not an exhaustive list.

- **Standards 1.1-3.1** | Have an industry guest speaker to explain safety protocols, professionalism, and industry careers.
- **Standards 4.1-4.2** | Work with a graphics firm on a real-world project.
- **Standards 5.1-5.3** | Job shadow a software publisher.
- **Standards 6.1-6.2** | Do a workplace tour of where 3D graphics are used so students can see the software and instruments firsthand.
- **Standards 7.1-7.9** | Job shadow at a local animation company.
- **Standards 8.1-9.3** | Have students do a project that is useful to a local employer that can be evaluated by the manager.
- **Standards 10.1-11.1** | Have an industry professional evaluate the students' portfolios.

For more ideas and information, visit <https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html>.

Course Description

Digital Arts & Design III is the third course in the *Digital Arts & Design* program of study. Applying design skills developed in prior courses, students will expand their creative and critical thinking skills to create comprehensive multimedia projects and three-dimensional designs. Upon completion of this course, proficient students will be able to use industry-standard software to create multimedia projects, web pages, three-dimensional models, and animations. Students will utilize research techniques to plan and enhance project outcomes. Standards in this course also include professionalism and ethics, career exploration, and business and project management. In addition, students will continue compiling artifacts for inclusion in a digital portfolio, which they will carry with them throughout the full sequence of courses in this program of study.

Recommended Credit

If all standards in the course are covered, the course is recommended for two credits. If only one credit is to be offered, two options are recommended. Option A focuses more on multimedia and web applications. Option B is tailored for programs with a specific interest in or capacity for teaching animation.

1 Credit - Option A

Content	Standards
Safety	1
Professionalism & Ethics in Design	2, 3
Career Exploration	4
Multimedia	5, 6
Web Applications	7, 8, 9
Three-Dimensional Graphics	10, 11
Research Project	21
Design Projects	22, 23, 24
Business Management	25, 26
Portfolio	27

1 Credit - Option B

Content	Standards
Safety	1
Professionalism & Ethics in Design	2, 3
Career Exploration	4
Three-Dimensional Graphics	10, 11
Animation	12, 13, 14, 15, 16, 17, 18, 19, 20
Research Project	21
Design Projects	22, 23, 24
Business Management	25, 26
Portfolio	27

Course Standards

1. Safety

- 1.1 Safety Protocols: Demonstrate the **ability to comply with personal and environmental safety practices associated with art and design applications**: the use of adhesives; hand tools; machines; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.
- Inspect, maintain, and employ safe operating procedures with tools and equipment.
 - Adhere to responsibilities, regulations, and Occupational Safety and Health Administration (OSHA) policies regarding reporting of accidents and observed hazards, and regarding emergency response procedures.
 - Complete a safety test with 100 percent accuracy. For equipment used in the course, complete equipment examinations with 100 percent accuracy in which the student performs an operational checkout by the instructor. Maintain a record of safety examinations and equipment examinations.

2. Professionalism and Ethics

- 2.1 Professional Attributes and Employability: Collaboratively develop a professionalism rubric for **professional attributes required within art and design professions**. Research job descriptions, career information, and online job boards to determine general employability skills and character traits most often mentioned or desired for digital art and design professionals. For each item on the rubric, define the characteristic, state why it is important for professionals working in these fields, and list performance indicators for the skill. Possible skills include:
- creative design skills,
 - ethical business practices,
 - honesty,
 - respect,
 - communication, and
 - responsibility.

- 2.2 Ethical and Legal Issues: Examine **current and emerging ethical and legal issues related to the digital art and design industry** (e.g., copyright, font licensing, piracy, photo manipulation, sustainability). Choose one such issue and develop a claim about its impact on society and the responsibility of the digital art and design professional.

3. Career Exploration

- 3.1 Post-Secondary Opportunities: Research **the range of credentials one can earn with advanced study of art and design at the postsecondary level** (i.e., technical certification, BA, BS, MFA, etc.). Investigate both in-state and out-of-state postsecondary programs in a variety of digital art and design fields, including but not limited to graphic design, photography, industrial design, digital media, animation, and more. Synthesize research conducted in previous Digital Arts & Design courses to update the portfolio career plan to achieve post-high school goals.

4. Multimedia

- 4.1 Multimedia Products: Drawing on research from industry journals and similar publications, analyze **how the principles of design converge with digital technology and imagery in motion graphics and multimedia**. Select a multimedia product and explain how the principles of design work in harmony with technical skills such as creating visual layouts, illustrations, and photographs to achieve the final product.
- 4.2 Design Process Application: **Apply the design process to complete advanced multimedia projects of increasing complexity for a range of applications such as print, web, film, and marketing communications**. Demonstrate the ability to select and use the appropriate tools and procedures to accomplish project goals. Gather and arrange image, audio, and media for incorporation into comprehensive media projects. For example, create an interactive presentation that a client could use as a marketing and educational tool for potential customers.

5. Web Applications

- 5.1 Design Constraints: Research **design constraints affecting the design of graphics and layouts for web devices**, including computers and mobile devices. Describe how design processes for the web differ from design processes for print or product creation. Evaluate and critique webpages based on the principles and elements of design and other considerations related to user friendliness and navigability.
- 5.2 Interactive Media: Apply **illustration, photography, and layout skills to create interactive media for use on the web**. For example, create a navigation bar, logo, or banner to incorporate in a web page.
- 5.3 Webpage Creation: Describe the **steps involved in creating webpages**. Use a content management system or web design software to create a simple informative webpage. Apply the principles of design and composition. Prepare images and illustrations in the proper format for use on the web. For example, as part of a design package for a client, create a mock-up of a webpage incorporating color schemes and graphics that coordinate with the design package.

6. Three-Dimensional Graphics

- 6.1 Three-Dimensional Modeling Research: Research and compile **examples of digital three-dimensional modeling and graphics created by design professionals in a range of industries**, such as entertainment, health sciences, architecture, engineering, aerospace, advertising, and graphic design. In a visual display such as an infographic, evaluate examples from at least five industries, citing the sources used.

- 6.2 Three-Dimensional Modeling Application: Perform **multistep procedures in industry software to create three-dimensional models of increasing complexity**. Apply design principles, mathematical concepts, and software tools to develop the design, including but not limited to:
- applying surface materials;
 - creating a background environment;
 - adding lighting features to create shading and shadow effects;
 - calculating area, diameter, circumference, and volume for two- and three-dimensional objects employing related geometric terminology;
 - positioning cameras to set up scenes;
 - rendering the models to create finished products; and
 - generating videos of three-dimensional models such as walkthroughs or flyovers.

7. Animation

- 7.1 History of Animation: Synthesize research from informational texts, including industry magazines and online resources, to create an annotated timeline or visual graphic emphasizing **significant time periods, technological advances, and key figures in animation**.
- 7.2 Principles of Animation: Research and report on the **principles of animation**. Examine movies, cartoons, or other animations to identify applications of the principles of animation. As a class, create, review, and revise a presentation explaining the principles of animation by citing resources and identifying examples in works of animation.
- 7.3 Animation Process: Describe **the animation process, outlining the steps involved in planning, creating, and editing an animation**. Drawing on research, perform multistep procedures to develop a three-dimensional animation. Steps should include:
- brainstorming to develop an idea,
 - conducting research to determine the target audience,
 - conducting research to develop visual ideas,
 - producing sketches of the presentation,
 - creating an environment for the animation, and
 - applying the principles of animation toward the completion of a working animation.
- 7.4 Animation Concepts: Create a storyboard to **develop animation concepts**. The storyboard should present visual elements of the animation, illustrations of the sequence of actions, and major themes and ideas. Present the storyboard to peers for evaluation. Revise and refine the storyboards based on constructive feedback.
- 7.5 Elements of Animation: Apply **three-dimensional modeling skills to create the elements of an animation**, including creating, modifying, and manipulating polygonal objects, and creating and applying surface textures.
- 7.6 Lighting and Animation: Compare and contrast the properties and **uses of different types of lighting for an animation scene**, including three point lighting, animated lighting, indirect and direct lighting, and environmental lighting. Use software tools to apply appropriate lighting to the scene, utilizing the principles of design and animation.

7.7 Animation Creation: Follow multistep procedures to use cameras, including animated cameras, to create animations. Demonstrate **the ability to bring conceptual ideas from the storyboards to fruition**.

7.8 Mechanics of Animation: Utilize animation software to **understand and apply the mechanics of animation**. Apply basic software techniques to create animations.

Techniques include the following:

- a. create and modify key frames and poses,
- b. change an objects state or position over time,
- c. establish an object's speed,
- d. move an object along a path, and
- e. apply basic rigging to a model.

For example, utilize software tools to simulate a mechanical cycle such as a ball dropping and bouncing.

7.9 Animation Effects: **Apply various animation effects when working on animation projects, including particle systems, environmental simulation** (wind, gravity, time), and other effects. Use appropriate rendering settings to render a sequence of frames. Save the file in appropriate formats for given applications and explain why a particular format is most acceptable for the selected application and audience, such as the use of a .swf file on a webpage.

8. Research Project

8.1 Research Project: In preparation for a design project, **perform in-depth research to investigate the context of the project's use and the potential users of the project**. Create an informative essay **describing the context of the design, citing both qualitative and quantitative research**. For example, for a three-dimensional animation of a product's design, make a claim for the targeted audience and the environment in which the product will be used, citing specific textual evidence to support the claim.

9. Design Projects

9.1 Multiple Media Usage: Apply the design process to complete projects of increasing complexity, combining **multiple media to communicate, market, or advertise across different platforms, including print, web, film, and other digital forums, in order to maximize audience reach and reinforce message**. Describe why multiple media are needed to accomplish project goals; specifically, justify why a web-based format is appropriate for one audience whereas a print format is more appropriate for another. Demonstrate the ability to select and use the appropriate tools, procedures, and project management techniques to accomplish project goals. Prepare a persuasive narrative to explain the project to a client, communicating the project in such a way that is understandable to the audience.

9.2 Critique and Refinement Strategy: **Utilize the critique and refinement strategy as part of the design process to achieve project goals.** As part of a design project, present preliminary design ideas in a way that is understandable to an audience using both visual and verbal explanations. Note constructive criticism received and use it to influence design refinement. Similarly, evaluate the work of others, drawing on design principles and project goals to provide clear, specific, and constructive feedback.

9.3 Software Application Usage: Complete **a project using multiple software applications.** Determine the appropriate software for each specific task and efficiently manage file content. Convert and export files as needed for the given application. For example, import photographs and illustrations into three-dimensional modeling software by appropriately linking the files.

10. Business Management

10.1 Design Proposal Components: Analyze the **components of a professional design proposal.** Write an informative text describing the purpose of each element of a proposal. Include strategies for the designer to use to generate the information contained in each section.

10.2 Professional Proposal: Use an online editing tool to **develop a professional proposal for a specific project.** Use a **variety of sources to gather data**, cite each source, and briefly describe why the chosen source is reliable.

11. Portfolio

11.1 Portfolio: **Update the digital portfolio to reflect the cumulative total of all projects undertaken across the program of study.** Compile information, sketches, photographs, illustrations, layouts, and design projects from each course. Include artifacts that demonstrate ability to use industry-specific technology. Select projects from course work that showcase qualifications as a design student. Upon completion of this course, the following artifacts should reside in the student portfolio:

- career plan,
- professionalism rubric, and
- example designs showing best work from each course.

Standards Alignment Notes

*References to other standards include:

- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
 - Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.