Maryland CTE Programs of Study

Animation and Game Development I (2025)

GENERAL REQUIREMENTS. This course is recommended for students in Grades 9-12. 1

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INTRODUCTION 2

A Career and Technical Education (CTE) instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions. 2.A

B The Arts, Entertainment and design Career Cluster combines creative roles in visual and performing arts, film, journalism, fashion, interior design, and creative technologies. This Cluster focuses on creating, producing, and sharing artistic and design work across multiple platforms, aiming to entertain, inform, beautify, and inspire. 2.B

C The Animation and Game Development pathway prepares students to create both two-dimensional (2D) and three-dimensional (3D) digital experiences for film, television, advertising, virtual reality, and interactive entertainment. Students progress from foundational 2D motion graphics to professional-level 3D modeling, rigging, rendering, and real-time integration, mirroring the production pipelines used by Maryland's leading animation and game studios. 2.C

D Animation and Game Development I is an introductory course within the Arts, Entertainment, and Design Career Cluster, aimed at high school students advancing skills in digital content creation and production. The class introduces simple 3D forms so students can compare 2D and 3D pipelines and begin preparing for an entry-level industry certification focused on foundational animation tools. 2.D

E Students will participate in at least two Career-Connected Education and Work-Based Learning experiences in this course, which might include informational interviews or job shadowing relevant to the program of study. 2.E

F Students are encouraged to participate in extended learning experiences through ligned Career and Technical Student Organizations (CTSOs). CTSOs are a

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cocurricular requirement in the Carl D. Perkins Act, and alignment to CTSO activities is an expectation for CTE programs in the state of Maryland. 2.F

KNOWLEDGE AND SKILLS 3

A The student demonstrates the necessary skills for career development, maintenance of employability, and successful completion of course outcomes. The student is expected to: 3.A

1. Identify and demonstrate positive work behaviors that enhance employability and job advancement, such as regular attendance, promptness, proper attire, maintenance of a clean and safe work environment, and pride in work. 3.A.1
2. Demonstrate positive personal qualities such as flexibility, open-mindedness, initiative, active listening, and a willingness to learn. 3.A.2
3. Employ effective reading, writing, and technical documentation skills. 3.A.3
4. Solve problems using critical thinking techniques and structured troubleshooting methodologies. 3.A.4
5. Demonstrate leadership skills and collaborate effectively as a team member. 3.A.5
6. Implement safety procedures, including proper use of software and following privacy guidelines. 3.A.6
7. Exhibit an understanding of legal and ethical responsibilities in the Animation and Game Development field, following data privacy laws and best practices for security. 3.A.7
8. Demonstrate time-management skills and the ability to prioritize tasks in a technical setting. 3.A.8

B The student identifies various career pathways in the Animation and Game Development field. The student is expected to: 3.B

1. Develop a career plan that includes the necessary education, certifications, job skills, and experience for specific roles in Animation and Game Development. 3.B.1
2. Create a professional resume and portfolio that reflect skills, projects, certifications, and recommendations. 3.B.2
3. Demonstrate effective interview skills for roles in media and Animation and Game Development. 3.B.3

C The student develops technology and digital literacy skills. The student is expected to: 3.C

1. Collaborate effectively on complex projects, communicate design concepts clearly, and present professional portfolios that showcase technical and creative expertise on a variety of platforms 3.C.1
2. Organize, manage, and document projects using file management systems, version control, and industry-standard terminology while adhering to ethical practices and copyright laws. 3.C.2
3. Use industry-standard tools such as Blender, Autodesk Maya, and Adobe Animate to design, model, rig, and animate 2D and 3D assets, incorporating advanced techniques like texturing, rendering, and lighting. 3.C.3

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4 Use Unity to import assets, manage scenes, and create interactive experiences through animation controls, particle systems, shaders, and scripting using C# programming. 3.C.4

5 Prepare 3D models, animations, and effects for efficient rendering and real-time performance, using techniques such as polygon reduction, UV mapping, and platform- specific optimization. 3.C.5

6 Create visually engaging content using Adobe After Effects for compositing, motion graphics, and post-production while applying principles of color theory, composition, and visual hierarchy. 3.C.6

D The student integrates core academic skills into Animation and Game Development practices. The student is expected to: 3.D

1 Document design processes, create project proposals, and present ideas using clear, professional language tailored to technical and creative contexts. 3.D.1

2 Use geometry, algebra, and proportional reasoning to create accurate 3D shapes, scale models, and optimize animations for timing, resolution, and performance. 3.D.2

3 Apply concepts of physics, motion, lighting, and optics to simulate realistic environments, effects, and interactions in animations and game design. 3.D.3

4 Write and debug scripts to control animations, game logic, and interactivity while using algorithms and problem-solving techniques to address technical challenges. 3.D.4

5 Apply design principles such as balance, contrast, and color theory to create visually engaging animations and interactive environments. 3.D.5

E The student demonstrates foundational digital-storytelling skills for animation and game development. The student is expected to: 3.E

1 Explain the 12 principles of animation in 2-D contexts. 3.E.1

2 Draft storyboards that visualize camera angles, timing, and action flow. 3.E.2

3 Write short scripts with basic plot structure and dialogue to guide animation projects 3.E.3

F The student demonstrates proficiency in 2D asset creation and animation using industry- standard certification software. The student is expected to: 3.F

1 Create vector and raster artwork suitable for 2D and 3D animation. 3.F.1

2 Animate simple characters or objects with keyframes, easing, and onion-skinning techniques at industry frame rates (e.g., 12, 15, 24, 29.97, 30 fps) including animating on the 1s and 2s. 3.F.2

3 Assemble animations in a non-linear editor (NLE), refine timing, and export in formats appropriate for web publishing and game-engine integration. 3.F.3

G The student demonstrates introductory knowledge of the game-development pipeline. The student is expected to: 3.G

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1. Describe the stages of game development, including design, asset creation, programming, testing, and deployment. 3.G.1
2. Assemble a simple playable scene in an industry-standard game engine using provided assets. 3.G.2
3. Apply basic programming or visual-scripting logic to trigger character movement and simple interactions. 3.G.3

H The student demonstrates digital-literacy and professional practices essential to animation and game development. The student is expected to: 3.H

1. Apply secure file-management practices, including consistent naming, version control, and backups. 3.H.1
2. Explain ethical and legal considerations such as copyright, licensing, and accessibility. 3.H.2
3. Identify career pathways and entry-level industry certifications related to animation and game development. 3.H.3

I The student demonstrates technical proficiency with modeling and rendering tools to develop projects. The student is expected to: 3.I

1. Model basic environments and scenes, applying spatial reasoning skills. 3.I.1
2. Demonstrate the use of modifiers in Blender or Autodesk to adjust the geometry and appearance of 3D models. 3.I.2
3. Export and import files across different formats, ensuring compatibility and quality preservation. 3.I.3
4. Conduct self-assessment and peer review to improve model accuracy and visual appeal. 3.I.4