Maryland CTE Programs of Study

Animation and Game Development II (2025)

GENERAL REQUIREMENTS. This course is recommended for students in Grades 10-12. 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 II is the second course within the Arts, Entertainment, and Design Career Cluster, aimed at high school students building skills in digital content creation and production. This course includes expanded units on interactive narrative design to teach learners to revise scripts and storyboard branching storylines. Coursework aligns to intermediate certifications in 3D modeling or game-engine artistry, depending on local software choices** 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**

Skip to main content

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, portfolio, and reel 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

Skip to main content

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 advanced 2D animation techniques and begins foundational 3D asset development. The student is expected to: 3.E

1 Produce multi-layer 2D animations incorporating parallax, virtual-camera moves, and synchronized audio. 3.E.1

2 Translate 2-D concept art into basic 3D forms through blocking or gray-boxing methods. 3.E.2

F The student demonstrates core skills in 3D modeling and texturing using industry-standard certification software. The student is expected to: 3.F

1 Model game-ready assets with correct topology and edge flow. 3.F.1

2 UV-unwrap models and create physically based texture maps, evaluating texel density for target platforms. 3.F.2

3 Optimize meshes for real-time performance, including polygon budgeting and level-of- detail strategies. 3.F.3

G The student demonstrates the ability to integrate assets and scripts within a game engine. The student is expected to: 3.G

Skip to main content

1 Import custom assets into a game engine and organize scenes, prefabs, and materials efficiently. 3.G.1

2 Develop player controls, simple AI behaviors, or user-interface events using scripting or node-based logic. 3.G.2

3 Implement lighting, post-processing effects, and basic physics to enhance gameplay. 3.G.3

H The student demonstrates narrative and level-design skills for interactive media. The student is expected to: 3.H

1 Revise storyboards and scripts to support branching narratives and player choice. 3.H.1

2 Apply level-design heuristics, including readability, onboarding, and difficulty curves. 3.H.2

3 Conduct play-testing sessions, gather feedback, and iterate on prototypes to improve engagement 3.H.3

I The student demonstrates interactive storytelling through theme development and foundational world building. The student is expected to: 3.I

1 Identify core themes and emotional arcs within interactive narrative experiences. 3.I.1

2 Construct basic narrative environments that support story elements, characters, and gameplay. 3.I.2

3 Establish setting and atmosphere through environmental assets, sound, lighting, and visual cues. 3.I.3

J The student explores core game mechanics and gamification strategies to increase engagement. The student is expected to: 3.J

1 Define and prototype core gameplay mechanics including player goals, rules, feedback, and challenges. 3.J.1

2 Analyze and apply gamification principles such as reward systems, achievements, and progression loops in educational or non-game contexts. 3.J.2

3 Evaluate user experience and motivation through feedback loops, difficulty curves, and onboarding strategies. 3.J.3

K The student demonstrates foundational programming skills in C# for game development using Unity. The student is expected to: 3.K

1 Use C# syntax and structures (variables, conditionals, loops, methods) to write scripts in Unity. 3.K.1

2 Implement basic game logic such as player movement, object interaction, and scorekeeping using C#. 3.K.2

3 Debug C# scripts using Unity's console and error logs to identify and resolve issues. 3.K.3

4 Apply object-oriented programming concepts (e.g., classes, inheritance) to structure game code effectively. 3.K.4

Skip to main content

L **The student demonstrates professional practices and preparedness for intermediate industry credentials. The student is expected to:** 3.L

1. Map personal skill development to intermediate certifications in 3D modeling, animation, or game-engine artistry. 3.L.1
2. Curate an online portfolio showcasing both 2D and 3D work. 3.L.2

M **The student exhibits mastery of project-based skills and workflow optimization. The student is expected to:** 3.M

1. Plan, develop, and present a 3D animation project from concept to completion, documenting each stage of production. 3.M.1
2. Optimize models and textures for performance efficiency within game engines like Unity. 3.M.2
3. Implement feedback from peer reviews to refine and improve project quality. 3.M.3
4. Prepare a portfolio showcasing completed projects and technical skills relevant to industry standards. 3.M.4