

SCOPE AND SEQUENCE

Course Name: Design & Illustration: Game Art & Animation

Instructor: Christopher Mendenhall

Career Cluster: Arts, Entertainment, and Design

Sub-Cluster: Design & Digital Arts

HS Course Credits: 1 fine arts and 2 electives

Additional: .5 Technology credit for VUHS students

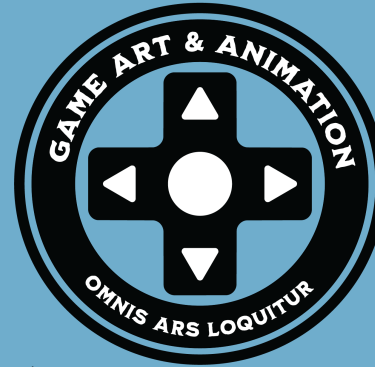
Additional: .5 Design credit for MUHS students

Fast Forward Optional Credits: ART 1420 VO01 - Digital Animation, Community College of Vermont

Tier 2 Credentials: VT Portfolio in the Areas of 3D Design/Animation/Game Design, National Career Readiness Certificate

Tier 1 Credentials: none

CTSO/Enrichment: SkillsUSA, National Technical Honor Society, The Rookies (Global Portfolio Platform & Contests)



Tagline: “Omnis Ars Loquitur”

Student appeal: Create 3D art and animations for video games!

Learn foundational skills and professional software used by game artists!

Artists in this course will become more effective visual communicators and explore how their 3D art connects with players. They will develop industry-facing portfolios that align with their career goals.

This year-long program will see Artists dive into career options for video games and beyond. Artists will develop a portfolio for college application, internships, or job applications.

Course Description: In D&I: Game Art & Animation, you will develop technical and aesthetic skills to create 3D art and animations for video games.

You will be introduced to and master the fundamental use of industry standard software - Autodesk Maya, Substance Painter, and Unreal Engine - where you'll learn the same techniques professional artists use to create the video games you play today! In this daily, year-long class you will discover how to utilize, reference, and critique traditional art principles to advance your own creative vision. You will discover how Design and Illustration are foundational to all visual communication within games and film.

The first half of the year will be dedicated to 3D modeling, texturing, and game engine integration. These are the skills you need to create your own digital worlds! The second half of the year will be utilized for learning the 12 principles of animations to create custom animations, such as walk cycles, jumps, and more.

Prepare to meet professional game developers, educators, and working artists throughout the year. You'll get the opportunity to ask questions, get feedback on your work, and network!

Throughout the course, you will bring together technical skills with traditional art techniques of Design and Illustration, like the principles of design, composition, and color theory, in your development of an industry-facing portfolio.

Proficiencies/Learning Targets:

LT 1: Industry Discovery - Students will be able to describe the variety of roles and jobs available to 3D artists. Students will be able to explain how artists are used in the production pipeline and what skills they need to get a job in the game industry.

LT 2: 3D Modeling Foundation - Students will apply foundational principles of polygon modeling for games to create 3D models that accurately portray the form and proportions of the subject. They will master the use of fundamental modeling tools and techniques (move, scale, rotate, extrude, cut, etc) and understand the virtual 3D space.

LT 3: UV Mapping Foundation - Students will apply foundational principles of UV mapping to create UV layouts for 3D models, enabling texturing. They will utilize professional techniques (seam management, UV space optimization) to eliminate distortion and texel density inconsistencies.

LT 4: PBR Texturing Foundation - Students will create aesthetically successful textures and materials for 3D meshes that are optimized for real-time rendering. Students will use Substance Painter's tools and layers systems, exporting textures for game engine integration.

LT 5: Critique Foundation - Students will successfully critique the work of others, and take critique in turn. They will develop professional habits for assessing and iterating based on critique.

LT 6: 12 Principles of Animation Foundation - Students will learn and utilize the 12 principles of animation to dissect, understand, and critique existing professional and student animations.

LT 7: 12 Principles of Animation Application - Students will apply the 12 principles of animation to create beginner-level 3D animations. They will demonstrate their understanding of keyframes, the graph editor, and proper rig controls manipulation.

LT 8: Animation Reel - Students will learn and utilize the technical pipeline required to render, optimize, and compile their animations into a professional demo reel. Students will demonstrate proficiency in configuring render settings, optimizing playback pacing, and displaying work strategically to target animation industry roles.

LT 9: Industry Engagement & Professional Communication - Students will actively engage with higher-education representatives and working game development professionals through mandated field trips and guest lectures. Students will demonstrate industry-standard networking skills, prepare targeted interview questions, and articulate how these interactions inform their personal career and portfolio pathways.

LT 10: Professional Presentation & Portfolio Curation - Students will build, format, and publish an industry-facing digital portfolio showcasing technical proficiencies, work-in-progress (WIP) documentation, and final rendered projects.

Standards: Standards are aligned with Vermont's CTE [Digital and Visual Arts proficiencies](#) Critical Proficiencies Anchor Standards (VT), which derive from and are aligned with the Common Career Technical Core Standards for the [Core Standards for the Arts, Entertainment, & Design](#).

Additional standards alignment includes:

PAHCC [Habits of Work](#): Collaboration, Respect, Empathy, Resilience, Safety, Work Ethic, Responsibility.

PAHCC [Transferable Skills](#): Creative and practical problem solving; Inquiry; Informed and Integrated Thinking.

[CCTC - Career Ready Practices](#)

Unit and Essential Question(s)	Estimated # of Classes Periods <i>(assumes 120-minute classes)</i>	Learning Targets
3D Modeling & Texturing		

Unit 1: Foundations of Art in Game Production Essential Questions: <i>What do game artists do and where do they fit in the production pipeline? How do we use our understanding of Design and Illustration principles to inform game art? How do we navigate a 3D space for creation?</i>	10 Classes 1200 Minutes	Learning Targets: LT1, LT2, LT3, LT4, LT5 ● Explain how artists are utilized in game production. ● Recognize the significance of the critique process. ● Analyze professional artwork and critique it using the principles of design. ● Demonstrate non-destructive saving practices. ● Demonstrate fundamental 3D modeling principles of camera movement and polygon manipulation using the following tools: ○ Move, Scale, Rotate, Extrude, Bridge, Cut, Bevel
Unit 2: 3D Modeling for Games Essential Questions: <i>How do we use and attribute references for our work? How do we texture a 3D model and make it look realistic? How do we show off our 3D model to potential employers and other artists?</i>	20 Classes 2400 Minutes	Learning Targets: LT1, LT2, LT3, LT4, LT5 ● Demonstrate giving and receiving peer feedback on class work. ● Explain the foundational standards for UV unwrapping and texture baking. ● Practice using PBR materials to texture a 3D model. ● Render high quality images for use in a professional portfolio. ● Demonstrate fundamental 3D modeling and UV unwrapping principles using the following tools: ○ Smooth, Weld, Snap, Unfold, Sew,

Unit 3: Building New Worlds: Model to Engine Essential Questions: <i>How do we become stronger visual communicators? What are strategies to prepare for networking and meeting professionals? How do we get our 3D models and textures in a game engine?</i>	25 Classes 3000 Minutes	Learning Targets: Learning Targets: LT2, LT3, LT4, LT5, LT9 • Analyze and select imagery for appropriate references. • Develop a visual modeling plan that accommodates the 3D pipeline. • Prepare for and engage with professional developer interviews. • Exhibit a 3D model in Unreal Engine 5. • Demonstrate intermediate 3D modeling, UV unwrapping, and exporting/importing principles using the following tools: ◦ Mirror, duplicate face, sweep mesh, texture extract
Unit 4: 3D Modeling Final Project Essential Questions: <i>How do we combine our learning with our own project? What principles of design can we use to create a compelling narrative within a 3D piece? What can we learn from professional portfolios when creating our own? What are the next steps to continue down this path of 3D modeling?</i>	25 Classes 3000 Minutes	Learning Targets: LT2, LT3, LT4, LT5, LT10 • Demonstrate comprehensive understanding of 3D modeling principles and tools taught up to this point. • Bring a unique 3D model from reference to portfolio (start to finish). • Actively iterate on work based on peer and instructor feedback. • Polish 3D modeling portfolio with professional renders and breakdown shots.

Animation (concurrent with CCV course ART 1420: Digital Animation)

Unit 5: The 12 Principles of Animation & Movement as Storytelling Essential Questions: <i>What is animation and where do we see it? How has animation evolved over time? How can we apply the 12 principles of animation to dissect all motion? What story are we telling through motion? What are keyframes and how do we use them to create animation?</i>	10 Classes 1200 Minutes	Learning Targets: LT5, LT6, LT7 • Describe the evolution of animation and accurately identify the 12 principles of animation within various forms of media. • Define and demonstrate the purpose of keyframes on a timeline to plot, track, and manipulate motion over time. • Apply core animation principles of squash and stretch, timing, and overlapping action to produce foundational 2D animations that convey weight and physical mechanics.
Unit 6: 2D vs 3D Animation & Animation Reels Essential Questions: <i>How does the pipeline and workflow of 3D animation differ from 2D animation? What is the purpose of rigging and how does an underlying skeletal structure dictate the deformation and movement of a 3D model? How do we translate the physical mechanics of human weight, balance, and gravity to 3D animation? What are the core components of an effective animation reel, and how does it best showcase technical skills?</i>	20 Classes 2400 Minutes	Learning Targets: LT6, LT7, LT8, LT10 • Analyze and articulate core differences between 2D and 3D animation workflows and pipelines. • Demonstrate functional rigging for a simple 3D model, applying proper joint hierarchy within Maya. • Animate believable humanoid motion by manipulating a character rig for accurate weight shift, anticipation, and balance. • Compile, edit, and export completed animation projects into a cohesive demo reel.

Unit 7: Character Animation for Games Essential Questions: <i>How do we use real-world video reference to recreate the physical mechanics of motion? How do the 12 principles of animation apply to complex, multi-layered interactions between a character and an object? What insights can working animators provide about the animation pipeline, and how does this inform our own portfolio development?</i>	25 Classes 3000 Minutes	Learning Targets: LT7, LT8, LT9, LT10 ● Apply the 12 principles of animation to block and refine a generic walk cycle, capturing accurate timing and balance. ● Animate a unique action sequence between a rig and a prop, demonstrating an understanding of keyframes, the graph editor, and rig control manipulation. ● Engage with a working professional animator during a guest lecture/interview, preparing targeted interview questions to understand industry expectations. ● Document work-in-progress (WIP) stages of the walk cycle and interaction animation to begin formatting an industry-facing demo reel for a portfolio.
Unit 8: Animation Suite Final Essential Questions: <i>How does an animator convey a character's unique physical and emotional state? What are the technical and aesthetic requirements for rendering and compiling animations into an industry-standard format? How do we curate and pace a demo reel to strategically target roles within the game industry?</i>	25 Classes 3000 Minutes	Learning Targets: LT7, LT8, LT10 ● Create a cohesive suite of character animations including an idle, a unique walk, and a specific action on a single 3D rig. ● Demonstrate beginner to intermediate level comprehension of the 12 principles of animation. ● Show proficiency in configuring render settings by rendering and compiling the final animation suite into a professional demo reel. ● Build, format, and publish the final rendered demo reel to an industry/educational-facing digital portfolio.