



MERCER
COUNTY COMMUNITY COLLEGE

COURSE OUTLINE

Course Number GAM 140	Course Title Game Design I	Credits 3
Hours: Lecture/Lab/Other 1/4/0	Pre-requisite: ENG 101, GAM 120	Implementation Semester & Year Spring 2022

Catalog description: Students develop the fundamental skills required to produce two-dimensional assets used in video games. Topics include environment design, character design, vehicle design, animation, user interface design, and other aesthetics. Students learn to use professional game engines and other digital content creation tools. Emphasis is placed on designing environments, characters, and optimizing workflows.

General Education
Category:
Not GenEd

Course coordinator: (Richard Giantisco, x3457, giantisr@mccc.edu)

Required texts & Other materials: (None)

Course Student Learning Outcomes (SLO):

Upon successful completion of this course the student will be able to:

1. Build prototypes to test game design concepts. [ILG 1,4, 10, 11; PLO 2-10]
2. Design concepts for digital games. [ILG 1-11; PLO 1-7, 9, 10]
3. Create sales pitches for digital game. [ILG 1,4-6, 8-11; PLO 2-9]
4. Design and develop appropriate 2D assets for games. [ILG 1,4-6, 8-11; PLO 1-11]
5. Critique Mechanics, Dynamics and Aesthetics of game design concepts and prototypes effectively. [ILG 1,4-11; PLO 1-11]
6. Design and build a game level, applying sprites, collision objects, lighting, and simple physics. [ILG 1,4-11; PLO 2-10]

Course-specific Institutional Learning Goals (ILG):

Institutional Learning Goal 1. Written and Oral Communication in English. Students will communicate effectively in both speech and writing.

Institutional Learning Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

Institutional Learning Goal 3. Science. Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

Institutional Learning Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

Institutional Learning Goal 5. Social Science. Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.

Institutional Learning Goal 6. Humanities. Students will analyze works in the fields of art, music, or theater; literature; philosophy and/or religious studies; and/or will gain competence in the use of a foreign language.

Institutional Learning Goal 7. History. Students will understand historical events and movements in World, Western, non-Western or American societies and assess their subsequent significance.

Institutional Learning Goal 8. Diversity and Global Perspective: Students will understand the importance of a global perspective and culturally diverse peoples

Institutional Learning Goal 9. Ethical Reasoning and Action. Students will understand ethical frameworks, issues, and situations.

Institutional Learning Goal 10. Information Literacy: Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

Institutional Learning Goal 11. Critical Thinking: Students will use critical thinking skills understand, analyze, or apply information or solve problems.

Program Learning Outcomes for Game Development (PLO)

1. Understand the historical development of game play.
2. Apply the design process to the research and development of professional video game concepts.
3. Apply narrative structures in the design of video games and levels.
4. Describe and reference industry trends and technologies in video gaming.
5. Design meaningful video game experiences and game mechanics appropriate to context.
6. Create diagrams, storyboards, and prototypes to specify game design concepts.
7. Develop games with level editing and scripting tools within industry standard game engines.
8. Understand basic programming concepts and apply scripting languages to create interaction in game environments.
9. Create 2D and 3D game art assets from game concepts, utilizing professional 2D digital imaging and 3D modeling and animation software.
10. Work effectively on interdisciplinary teams producing functioning games and levels.

Units of study in detail – Unit Student Learning Outcomes:

Unit I “Tool Basics” [SLO 1, 2, 4]

This unit introduces students to the production process for two-dimensional (2D) game assets from concept to the final, live, in-game product. Students will design and create 2D game assets using current professional game engines and digital content creation software. Emphasis will be placed on applying both analog and digital tools, industry standard workflows, and various techniques to complete specified projects.

Learning Objectives

The student will be able to:

- Explain game design concepts such as silhouette, line art, shading, complex vs. simple, and warm vs. cool.
- Design and create unique concept art based on reference imagery and research data.
- Develop and apply industry standard workflows and best practices to produce 2D game assets.
- Organize and archive work utilizing efficient hierarchies and effective formats.

Unit II “Pixel Art” [SLO 2, 4]

This unit explores the methods and techniques used to create Pixel Art for video games. Students will review a range of professional video games and develop pixel art that aligns with specific motifs and industry standards. The unit also addresses the challenges that concepts such as anti-aliasing, resolution, banding, and limited color palettes pose to the production of optimized and effective game assets.

Learning Objectives

The student will be able to:

- Explain pixel art concepts such as anti-aliasing, orphan pixels, banding, and pillow shading.

- Plan and apply appropriate pixel resolutions and color palettes for game art.
- Design and create effective lighting for pixel art objects.
- Optimize pixel art to limit “jaggies” and other distracting artifacts.

Unit III “Avatar Design” [SLO 1, 2, 4, 5]

This unit focuses on the development process, from concept to final product, for designing a 2D video game avatar. Students will study a wide range of real-life, commercial examples to develop production skills and techniques to generate specific genres, styles, and interactive mechanics. The unit will also analyze standard practices for creating character turnarounds, dynamic lighting, and sprite optimization for video game avatar types.

Learning Objectives

The student will be able to:

- Adapt natural, real-life elements to compose stylized 2D caricatures.
- Explain game design concepts such as proportion, shape repetition, dynamic posing, turnarounds, and lineups.
- Create 3D lighting for sprites through Normal map production and application.
- Optimize avatar asset components for animation and gameplay requirements.

Unit IV “Sprite Animation” [SLO 1, 2, 4-6]

This unit examines the professional workflows and techniques utilized to create 2D animation for video games. Students will design and animate avatars, objects, and special effects to express and display the results of interactions that occur during gameplay. Emphasis will be placed on developing clear, appealing, and optimized animations that enhance and support the narrative and gameplay mechanics.

Learning Objectives

The student will be able to:

- Explain basic animation concepts such as squash and stretch, anticipation, exaggeration, arcs, follow through, and overlapping animation.
- Create basic navigation animations for a video game avatar.
- Design and apply basic avatar game states, input controls, animation mapping, and navigation logic.
- Compose and apply sprite sheets and object-based animations for use in game engines.

Unit V “Level Design” [SLO 1-6]

This unit analyzes the professional design strategies and structures utilized in contemporary 2D game level design. Students will design and build a playable, 2D game level using a professional game engine. The unit will present several commercial game level examples for students to reference, research, and emulate to practice and develop standard industry skills and techniques.

Learning Objectives

The student will be able to:

- Explain level design concepts such as foreground, middle ground, background, sorting layers, collision detection, etc.
- Create dynamic lighting for 2D level assets by applying Normal maps and/or specified render pipelines.
- Design and construct a video game level utilizing a professional game engine.
- Generate a simple, playable game build for playtesting and prototyping concepts.
- Develop and present a game pitch for crowd-funding investment.

Evaluation of student learning:

PROJECTS

Project 1: Collectible Tool

- Project 2: Pixel Power
- Project 3: Animal Avatar
- Project 4: Sprite Animation
- Project 5: Game Level

Each project will be evaluated using various criteria. The specific goals, deliverables, and requirements of each project will be identified in the description document for each project. Please note the due dates. Most of these projects will be subjected to in-class critiques from both the professor and your fellow students. This means that in addition to the quality of their final product, each student will also be graded on their delivery of any required prototypes or iterations, their participation during critiques, and how they collect and process feedback from their professor and peers.

Projects that are only submitted on the final deadline date without any of the required prototypes or iterations will receive a maximum grade of "C". Iteration is important. Please prototype your projects accordingly. Work that is turned in after class on the day that it is due will be considered late. The highest grade that late projects can receive is a "C".

GRADING

Projects	60%
Class Exercises & Quizzes	20%
Attendance	10%
Homework	10%
<hr/> Total	100%