



DIG-553: ADVANCED GAME PROTOTYPING

Effective Term

Fall 2024

BOT Approval Date

11/09/2023

Discipline

DIG - Digital Media

Course Number

553

Course Title

Advanced Game Prototyping

Short Title

Advanced Game Prototyping

Credit Status (CB 04)

D - Credit - Degree applicable

Units**Activity Units**

3.00

Total Units

3

Hours**Activity Contact Hours**

96-108

Out of Class Hours Activity

48-54

Total Contact Hours

96 - 108

Total Out of Class Hours

48 - 54

Total Student Learning Hours

144 - 162

Distance Education

No

Catalog Description

This course covers advanced game development and techniques within the digital game development process. Students will learn advanced integration of production assets into the game development pipeline and produce a culminating project that explores player psychology and game interaction.



Requisites

Prerequisite(s)

Prerequisite(s) (must be taken before)
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DIG-552 (with a grade of C or better).
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Codes

TOP Code (CB 03)

0614.20* - *Electronic Game Design

CIP Code

50.0411 - Game and Interactive Media Design.

Student Accountability Model (SAM) Priority Code (CB 09)

B - Advanced Occupational

Noncredit Category (CB 22)

Y - Credit Course

Repeatability Code

No

Grading Option

Letter grade OR P/NP

Minimum Qualifications

Minimum Qualifications	And/Or
Multimedia	End

CSU Area(s)

IGETC Area(s)

Learning Objectives

Learning Objectives

Learning Objective
1. Create an original game project that incorporates various game mechanics, characters, and narratives.
2. Examine and analyze the aspects of psychology in game design.
3. Evaluate advanced techniques of modern game engines and their role in the game development process.
4. Apply advanced digital prototyping techniques for game development testing.
5. Analyze the impact of implicit biases on game design and prototyping processes.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome
1. Students will transform creative ideas into tangible forms.
2. Students will generate new meaning using different media.
3. Students will adapt and apply a technical skill in a new and novel situation.

Program Learning Outcomes

Learning Outcome

Integrate theory with technical skills in digital media projects.

Devise innovative solutions to workflow-related problems.

Analyze the implications of technology changes on the digital media industry.

Apply appropriate design decisions and techniques in new, industry-relevant contexts.

Interpret and produce digital media content in a culturally responsive manner.

Institutional Learning Outcomes

Aesthetic Awareness: The student will identify and evaluate how aesthetic expression leads to an appreciation of social and cultural context as well as the values of art and nature.

Communication: The student will effectively express and exchange ideas through listening, speaking, reading, writing, visual works, and other modes of interpersonal expression.

Critical Thinking: The student will analyze problems, gather and synthesize relevant information, evaluate ideas, information, and evaluate alternative points of view to create, innovate and implement effective solutions.

Cultural Awareness and Humility: The student will demonstrate knowledge of and sensitivity toward individuals of diverse ethnicity, age, gender, sexual orientation, and religious affiliations, as well as toward those individuals with diverse abilities and socio-economic classes to respectfully interact with individuals of diverse perspectives, beliefs and values while being mindful of the limitation of their own cultural frameworks.

Information and Technology Literacy: The student will access, interpret, evaluate, and apply relevant information sources and digital media effectively, and in an ethical and legal manner.

Social Awareness: The student will recognize and analyze the interconnectedness of global, national, and local concerns, analyzing cultural, political, social, and environmental issues from multiple perspectives and appreciate similarities and differences among cultures.

Civic

Personal

and Professional Responsibility

Content

Course Activity Content

1. The Business of Games
 - a. Game Studio
 - i. Funding
 - ii. Investors
 - iii. Development Costs
 - b. Project Management
 - i. Milestone Deadlines
 - ii. Task Tracking
 - iii. Bug Tracking / Player Feedback
 - c. Ethical Issues in Current Studio Models
 - i. Sexism in Gaming Culture
 - ii. Power Imbalances and Gender Pay Gaps
 - iii. Retaliation
2. Game Design
 - a. Advanced Game Design Concepts
 - i. Player Psychology
 1. Intrinsic Rewards
 2. Extrinsic Rewards
 3. Zeigarnik Effect
 4. Ovsiankia Effect
 - ii. Loot Boxes / Mystery Boxes
 - iii. Monetization

- iv. Flow & Immersion
 - v. Habits
 - vi. Juice & Feedback
- b. The Impacts of Seeing 'Self' in a Game
 - i. Diversity and Inclusivity in Game Design
 - ii. The psychology of bias & stereotypes
 - 1. The Impact on Player Experience
 - iii. Benefits of Player representation
- 3. Game Engine Technology
 - a. Advanced Engine Techniques
 - i. Advanced Game Pipelines
 - ii. 3d Light Mapping
 - iii. Artificial Intelligence
 - b. Advanced Prototyping Techniques
 - i. Animation Blend Trees
 - c. Game Engine Physics
 - d. Game Engine Lighting / Rendering
- 4. Game Project
 - a. Game Project
 - i. Movement / Camera Controls
 - ii. Inputs
 - iii. Inventory
 - iv. Enemies / Pathfinding
 - v. Health / Lose Conditions
 - vi. Levels / Scene Management
 - vii. Design Prototype Mechanics
- 5. Level Construction
 - a. Level Building Tools
 - i. Colliders
 - ii. Materials / Textures
 - iii. Lighting / Bake Maps
 - iv. Animation
 - v. Particle Systems
 - vi. Game Build / Testing

Methods of Instruction

Method

Observation and Demonstration

Integration

Observation and step-by-step demonstration using a visible computer screen provide a personal experience with game prototyping methods.

Method

Visiting Lecturers

Integration

Local small game studio owners will guest lecture as a way of educating students on the requirements and ability of local game studios in the broader industry.

Method

Group Projects

Integration

Students will work in groups to develop prototypes of a headlining game for a proposed studio start-up. The group will discuss, decide, and develop the game prototype and game business model and pitch it to the class.

Methods of Evaluation**Method**

Portfolios

Integration

Portfolio generation exhibiting artifacts communicating animation skills, cultural awareness/sensitivity, and industry knowledge. The portfolio will be evaluated for the number of artifacts, artifact quality, contribution to character/in-game diversity, and visual communication.

Method

Projects

Integration

Projects demonstrating proficient understanding on the psychological aspects of game development and playability. The project will be evaluated based on concept, psychological approach, and effective game interaction.

Method

Capstone Project

Integration

A culminating capstone game project will allow students to develop and prototype their own custom game project and launch it for playable sessions by their peers and instructor. The capstone game will be evaluated based on its successful launch and player feedback in addition to its ability to present a unique perspective on the world divergent from the player's own experiences.

Assignments**Assignment Type**

Other

In-class and/or outside of class

Outside of class

Formative or Summative

Summative

Assignment

Assignment Example - 3D First-Person Adventure

Create a 3d first-person adventure game such as a first-person shooter or stealth action game.

CRITERIA (3d First Person Adventure will include the following elements)

Creation of 3d level environment using prototyping tools and 3d modeling software

Creation of 3d props, enemies, and hazards
Creation of 3d particle effects systems for visual effects
Creation of 3d materials and textures
Creation of 3d lighting system
Create functioning User Interface to provide feedback to player

GOALS (Students will be able to)
Use 3d application to make assets for their game
Use 3d applications to animate assets for their game
Use 2d applications to make menu interface
Create complex prefab game objects to work in the game world
Create complex game controllers and inventory system for the player character
Manipulate game scripts to adjust the difficulty of game and enemy behavior
Create a complete game loop in which players can win/lose and restart

Assignment Type

Writing

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Assignment: Game Studio Business Plan

Overview:

In this assignment, you will write a business plan for a game studio of your choosing. The business plan should include a detailed analysis of the gaming market and the target audience, as well as a marketing strategy, financial projections, and a management plan. The purpose of this assignment is to provide you with the opportunity to think critically about the business aspects of game development, while also helping you develop valuable research, planning, and communication skills.

Instructions:

Choose a game studio concept that you are passionate about and conduct research on the gaming industry to identify the target audience, competition, and market trends.

Write a business plan that includes the following elements:

Executive summary: Provide a brief overview of the business plan, highlighting the studio's mission, vision, and goals.

Market analysis: Conduct a comprehensive analysis of the gaming industry, including the target audience, competition, and market trends.

Marketing strategy: Develop a marketing strategy that identifies the target audience, defines the brand identity, and outlines the promotional tactics that will be used to reach the target audience.

Financial projections: Create a set of financial projections that include income statements, balance sheets, and cash flow statements. The projections should be based on realistic assumptions and should demonstrate the viability of the business.

Management plan: Describe the organizational structure of the game studio, including the roles and responsibilities of the key team members and the processes that will be used to manage the business.

Submit your business plan to the CMS.

Assignment Type

Reading

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

Assignment: Diversity in the Game Industry Article Analysis

Overview:

In this assignment, you will read an article about diversity in the game industry and analyze its key arguments and implications for game developers. The purpose of this assignment is to help you develop critical reading skills and to increase your understanding of the importance of diversity in the game industry.

Instructions:

Find an article about diversity in the game industry from a reputable source, such as a scholarly journal or industry publication. Some examples include:

"The Game Industry's Diversity Crisis" by Brianna Wu in The New York Times

"Why Diversity in the Gaming Industry Matters" by T.L. Taylor in Forbes

"Game Industry Insights: Diversity in Game Design and Development" by Autodesk

Read the article carefully, taking notes on the main arguments and evidence presented. Consider how the article relates to the broader conversation about diversity and inclusion in the game industry.

Write a 1-2 page analysis of the article that includes the following elements:

A brief summary of the article, including the main arguments and evidence presented.

An evaluation of the article's key arguments and evidence, including strengths and weaknesses.

An assessment of the implications of the article for game developers, including specific strategies for promoting diversity and inclusion in game design and development.

A reflection on your own views of diversity and inclusion in the game industry and how they have been impacted by the article.

Submit your analysis to the CMS.

Course Materials**Textbooks**

Gibson, Jeremy (2022). Introduction to Game Design, Prototyping and Development: From Concept to Playable Game with Unity and C# (3rd Edition). Addison-Wesley Professional. ISBN-13: 978-0136619949

Class Size Information**Class Size**

32

Class Size Category

G - Large lab 32

Diversity and Inclusion

Explain how diversity and inclusion(e.g., gender, culture/race, sexuality, etc.) is infused into the course.

As a technical/skill-based course, students will consistently apply their technical knowledge in projects/animations that reflect/communicate their views, beliefs, and concerns about society, race, gender, and self while also providing the platform to experience perspectives outside their own through gameplay analysis.

Addressing diversity and inclusivity in game design (2.b.i in the COR): One way to address diversity and inclusion is to analyze how different aspects of games, such as character design, narrative, and game mechanics, impact different players. Instructors can encourage students to think critically about how different groups are represented in games and consider ways to create more inclusive and diverse game experiences.

Addressing the current issues in the game studio model (1.c. in the COR) and the resulting sexism, gender pay gaps, and retaliation that have come to light.

Examining the psychology of bias and stereotypes (2.b.ii in the COR): This course will examine the psychology of bias and stereotypes in game design and player experiences. Students will be encouraged to analyze how implicit biases and stereotypes impact game design and the experiences of players, and explore ways to mitigate these effects.

Exploring the psychology of inclusivity and representation (2.b.iii in the COR): This course will explore the psychology of inclusivity and representation in games, including the benefits of representation for players, and the ways in which representation can impact player experiences and outcomes.

Encouraging open and respectful dialogue: Finally, instruction will foster an environment of open and respectful dialogue about diversity and inclusion in games, encouraging students to share their perspectives and experiences, and promoting empathy and understanding for different perspectives.

Describe how assignments, instruction, evaluation, course content, and interactions are contextualized for diverse learners promoting an equitable course.

Course instruction and assignments will emphasize the importance of representing diverse experiences and perspectives in game narratives, characters, and mechanics. Instruction will create a welcoming and inclusive classroom environment by promoting respectful communication and addressing any biases or discriminatory behavior. Additionally, assignments and lectures will help expose students to a range of game genres and styles from diverse creators to broaden their understanding of the potential impact and significance of diverse representation in games.

Interactions

Explain how the course will incorporate student-to-student interaction.

Student assignments will be influenced by cultural styles and techniques throughout the world incorporating them into their own artifacts showcasing various cultural backgrounds and the source of inspiration upon completion of the artifact. Students will engage in reflective critique and peer conversations of the presented content of their own created artifacts throughout the course and discuss with their peers the experiences and cultural backgrounds used to inspire the creation.

Explain how the course will incorporate instructor-to-student interaction.

Using the course discussion forums and/or in-class discussions, the instructor will present artifacts of the creative discipline and industry-created artifacts from other markets and cultural backgrounds. Students will deconstruct these artifacts and discuss the merits of the presentation and how the source artifact's cultural background contributes to the work in a unique way.

Explain how the course will incorporate student-to-content interaction.

Students will learn about various markets and how products evolve throughout time and from different cultural markets and what historical-cultural influences lead to those differences. Students will learn design principles and differences from these historical-cultural artifacts and how they succeeded (or failed) in these markets to better understand how to tailor their content for a higher degree of success in these markets.

Explain how the course will incorporate student-to-self interaction (metacognitive).

Students will be expected to build on the concepts from previous discussions and class examples to allow them to blend a wide variety of cultural influences into their work throughout the course. Students will study cultural content for their work and translate it into their work for effective communication and reflection of the researched culture by an end-user of the student's artifact design.